9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

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Preliminary Report on the Lau Group, Fiji.

Edwin H. Bryan, Jr.

[Title Page]
[p. i]

9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

PRELIMINARY REPORT ON THE LAU GROUP, FIJI.

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Table of Contents.

Introduction.

Plant Life.

Animal Life.

Maps.

Summary of W.G.Foye's Geological observations on Lau.

Simple geologic classification of all the Lau islands.

Average rainfall in Lau.

Summary of the population of Lau.

103 Survey of the individual islands. (with maps)

1. Ongea
2. Fulanga
3. Naiambo
4. Yangasa Cluster
5. Namuka-i-Lau
6. Mothe & Karoni
7. Oneata
8. Komo
9. Olorua
10. Kambara
11. Marambo
12. Wangava
13. Tuvunasithi
14. Aiwa
15. Lakemba
16. Mbukatatanoa Reef
17. Reid Reef.
18. Yarowa
19. Katafanga
20. Vekai.
21. Tuvutha'
22. Naiau
23. Vanua Vatu
24. Thithia
25. Mango
26. Kanathea
27. The Exploring Island
28. Vanua Mbalavu
29. Aves
30. Malata
31. Susui
32. Munia
33. Thikombia-i-Lau
34. Sovu
35. Kimbombo
36. Nailangilala
37. Naitaumba and Malima
38. Yathata ~~& Kaisaba~~
39. Kaimbu
40. Mukutolu
41. Vatu Vara.

Plates. (50 photographs.)

[p ii]

9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

PRELIMINARY REPORT ON THE LAU GROUP, FIJI.

by E. H. Bryan, Jr.

(Whitney South Sea Bird Expedition, July to October, 1924.)

Introduction.

101 [131] The Lau or Eastern Group, of Fiji, consists of about 40 islands or clusters of islets and numerous reefs, extending from S.16° 40' to S. 19° 15' and from 178° 20' W. to 179° 30' W. It constitutes [648] a frontier between Fiji and Tonga, and has in past years been the 144 scene of numerous invasions from the latter group. On several of the islands the Tongan strain is quite noticeable. The majority of 231 the islands are inhabited by an industrious people, who live on 241 262 fish, pigs, fowl, and yams, sweet potatoes, taro, and manioc and 245 bananas, which they raise extensively for local consumption. The main product of the islands is copra which is dried in quantity from the extensive groves of coconut palms. Many of the men are 327 skillful carvers, making attractive yaquona (yang-gona) bowls, combs, clubs, wooden pillows, and canoes. The women weave mats from the 285 leaves of the Pandanus, and beat out the sap wood of the paper 287 824 mulberry (Broussonetia papyrifera) into a bark cloth called masi, the process being called samusamu.

133 There are three types of islands in Lau, as follows: limestone, volcanic, and a combination of both. Portions of some of the islands are sandstone, but no island is completely made up of this material. The types are so distinctive that they may be identified at a glance.

The limestone islands are exceedingly rough. The material is upraised coral reef. Their surface has been eroded into sharp ridges or hummocks separating deep pot-holes with jagged-faces. The coast line includes deep bays, rugged cliffs and isolated rocks; all typically under-cut at the water's edge. This gives the smaller

133 islets and rocks a characteristic "mushroom" shape. The surface,
[137] even on the small low islands, is densely covered with forest, and
is comparatively moist. The indentations are choaked with mangrove
swamps. The highland is marginal with the center a flat or basin.

133 In contrast to this, the islands of volcanic material are
137 smoother with rounded ridges and peaks. The beaches are predominately
sandy with small areas of dark basalt at the points. The slopes above
the everpresent fringe of coconut palms and cosmopolitan littoral trees
are generally grassy with low scrub and scattered Pandanus and
Casuarina trees. Although the slopes are dry there is usually a small
stream in each valley. The highest elevation is in general toward the
center. This summit may bear a tuft of trees, if of sufficient
elevation (and also when not cleared off by the natives), but these
are simply lowland species which have crept up the valleys.

133 Most of the larger islands, however, are a mixture of limestone
and volcanic material. This typically takes the form of a ring of
limestone hills enclosing a basin of volcanic material. Vanua Mbalavu
is made up of a chain of volcanic hills tapering off into limestone
at both ends. On some of the islands, such as Katafanga, the transition
between the two is as sharp as if cut by a knife.

Plant Life.

137 The vegetation depends primarily on the geological formation.
All the limestone islands and the limestone portions of the mixed
islands support one type of forest. It is made up throughout the
group of the same fifty or so species of trees and ~~shrubs~~ tall shrubs,
with an undergrowth of Piper (wangawa), bird's eye pepper (rokete),
ferns, herbs and several vines. The luxurience alone depends upon
the size ~~of land~~ and elevation of the island. There is an interesting
rapid and progressive increase in the number of species and the height
of growth, from the nearly bare rocks, such as Latei Viti and Bacon
Island, with but two or three species of prostrate herbs, to the

7 [i.e. limestone islands--analyst]

137 splendid forests of Kambara, Nggo, etc. First to appear after the herbs and vines are low, stunted trees of such widespread species as Hernandia peltata, Tournefortia argentea, and a Ficus with orange fruit commonly eaten by pigeons. A few of the small islands have native palms in considerable numbers. Pandanus and Casuarina appear early in the scale.

The dominant plant over much of the volcanic islands is a plume grass, Eulalia japonica, called "nasau" or "ngasau" by the natives. There are also several species of wiry ferns, including the "staghorn"; a low scrub, made up of about half a dozen widespread species of shrubs and stunted trees; and scattered Pandanus and Casuarina. The dominant littoral species are: dilo (Calophyllum inophyllum), vutu (Barringtonia speciosa), evu (Tournefortia argentea), evuevu (Hernandia peltata), nawanawa (Cordia subcordata), tatang-gaa (Acacia lauriflora), veveddu (Scaevola koenigii), tavola (Terminalia littoralis), drala (Erythrina indica), etc. Besides these there are the usual Pandanus, numerous vines, and groves of coconut palms.

About 390 species of plants were collected in the outlying islands of Fiji, 233 being from Lau. This collection represents the majority of the common plants of the region.

Animal Life

136 Except for birds and insects there is a povety of animal life in Lau. The only mammal noted was a rat. About a dozen species of water birds and over 28 species of land birds were encountered throughout the group. Two species of land snakes and one banded water snake were caught. Lizards of various species were abundant. The largest was the green "vokai". Various sizes of geckos and skinks were more abundant. Land crabs, including the large "coconut" crab and hermit crabs were present in quantity. The insect life will form the subject of a separate report, when the extensive collection has been mounted and identified.

[p.3]

136 A careful record of the bird life on each of the islands was kept by Mr. Jose' G. Correia, the assistant Ornathologist. According to his notes the principal birds throughout the Lau Group are as follows:

Land Birds

Large Hawk
Small Hawk
Pigeon, common Suva
Pigeon, common Samoan
Pigeon, black
Doves, common
Dove, yellow
Dove, ground
Gallinule
Parraquit
Brown-eye
Shrike
Tarbler
Broadbill
Honey-eater
Swallow
Swift
Fantail, gray
Fantail, brown
Kingfisher
Yellow-eye
Yellow-belly
Flycatcher, sooty
Red cap
Rail
Cuckoo

Barn owl
Duck (Teal)
Wild chicken.

Water Birds

Herons, blue and white.
Heron, small gray.
Tern, white
Tern, sooty
Plover, Golden
Tatler
Lesser Frigate
Platus Booby
Booby, red-footed
Turnstone, ruddy
Tropic-bird, yellow bill

133 Most of the islands are surrounded by a barrier reef, which in many cases extends several miles off shore. The majority of the islands also have fringing reefs. There are also a number of reefs, some of which completely enclose lagoons, containing no elevated land. These supply the marine biologist with a rich collecting ground. But no opportunity was allowed on this hasty land survey to study marine life.

128 In the following summary of the individual islands, the subjects will be discussed in the following order:- 1, location, 2, dimensions. 3, topography and surface, 4, harbors, anchorages and landing places, 5, water, 6, special notes on vegetation and fauna, 7, inhabitants, 8, cultivation and other occupations, 9, historic, 10, prehistoric.

A sketch map, corrected in the field, is furnished of each island.

Maps.

126 The maps were constructed as follows:- The outline of the island and the reefs was enlarged four times from the largest scale maps available, (H.O. Charts 2851 and 2852). This sheet was carried into the field, the outline corrected and the topography sketched in. While no instrument was used, most of the islands were sufficiently small to enable a fair degree of accuracy with the naked eye. The final maps were traced from these field sheets.

104 There has been considerable confusion regarding the spelling of Fijian place names. When the language was reduced to writing by the early missionaries, several short-cuts or contractions of orthography were introduced. The principal of these were as follows:- b was used for mb, d for nd, g for ng, and q for ng-g.

Most of the older maps used these simplified symbols in spelling the names. As this made their pronouncing very difficult for those not fimiliar with the Fijian orthography, the United States Hydrographic Office and other publishers of nautical charts kept the phonetic spelling.

[197] [177] In addition to this, further complications arose because of the differences of pronounciation in different parts of Fiji. The Tongan influence in Lau accounts for the substitution of "Fulanga" for "Vulanga". Even the group is known to the natives on the larger islands as "Viti".

[126] On each island visited special pains were taken to ask the natives the names of all the islands, peaks and districts in sight, and their pronounciation was noted. These were checked against the spelling on the latest Fiji Government map ("corrected to 1924") and, allowing for the variation in pronounciation, they were spelled phonetically. In nearly all cases this spelling agreed with that on the Government map, expept that the double g is here used in the sound ng-g (represented by q in the contracted spelling) as in Nasanggalau.

113

SUMMARY OF W. G. FOYE'S GEOLOGICAL OBSERVATIONS ON LAU.

(Proc.American Acad.Arts & Sciences, 54:1, pp.43-44, 1918.)

133

1. The Lau islands are underlain by volcanics, formed during the second period of andesite eruptivity, then maturely eroded, and finally submerged.
2. During long submergence, coralliferous limestones were laid down unconformably on these volcanic rocks.
3. A later uplift elevated the coralliferous limestones above sea-level.
4. During a later basaltic period of volcanic eruptivity, olivine andesites or basalts intruded the elevated limestones.
5. With succeeding erosion a large amount of the elevated limestones disappeared, largely owing to atmospheric solution.
6. Most of the islands show a recent submergence.

According as the various islands have passed through all, or only a part, of these stages, the Lau islands may be classified as follows:-

I. Islands depressed and covered with limestone and later uplifted and intruded or covered by volcanic rocks of the second period.
   A. Islands depressed so deeply that the tops of the andesite hills of the first period were covered by limestone.
      1. Islands with limestone partly or wholly eroded from the summits of the andesite. VANUA MBALAVU, SUSUI.
      2. Islands with volcanic rocks of the first period still covered with limestone. KAMBARA.
   B. Islands whose tops were never covered by limestone. KANDAVU.

II. Islands depressed and covered with limestone and later uplifted but not affected by the second period of volcanic eruptivity.
   A. Islands depressed so deeply that the tops of the andesitic hills were covered with limestone.
      1. Islands with limestones eroded partly or wholly from the summits of the andesites. Malatta, Avea, Thikombia-i-lau, Tuvutha'.
      2. Islands with volcanic rocks still covered with limestone. VEKAI, FULANGA, ONGEA, WANGAVA, VATOA.
   B. Islands whose tops were never covered ~~with~~ by limestone. LAKEMBA, ONO-I-LAU.

III. Volcanic islands of the second volcanic period built on platforms composed of ~~alternate~~ coralliferous limestone overlying depressed hills of the first volcanic period. MUNIA, KANATHEA, ONO, MBENGHA.

SIMPLE CLASSIFICATION OF THE LAU ISLANDS VISITED BY FOYE.

1. Islands composed of both limestone and volcanic rocks:

VANUA MBALAVU	MALATTA	THIKOMBIA-I-LAU
SUSUI	AVEA	TUVUTHA'
LAKEMBA	ONO-I-LAU	KANDAVU [1]
	KAMBARA	

2. Islands composed of limestones alone: VEKAI, FULANGA, ONGEA, WANGAVA, VATOA.

3. Islands composed of volcanic rocks only: MUNIA, KANATHEA. (Ono-i-Kandavu and Mbengha [not in Lau])

[1] [This island is not in Lau--analyst]

[p.6]

133

SIMPLE GEOLOGIC CLASSIFICATION OF ALL THE LAU ISLANDS, FIJI.

(As observed by E.H.Bryan,Jr., following the arrangement suggested by W.G.Foye, Proc.Am.Acad.A.&.Sci.54:1,p.44).

1. ISLANDS COMPOSED OF LIMESTONE ALONE:

Ongea	Marambo	Bacon	Kimbombo (1 of 3)
Fulanga /(4)	Wangava.	Latei Viti	Kaimba
Yangasa Cluster	Tavunasithi	Latei Tonga	Vatu Vara (?)
Namuka-i-Lau	Aiwa (2)	Vekai	Vatoa (not seen personally)
Karoni	Vanua Masi	Sovu (3)	

2. ISLANDS COMPOSED OF BOTH LIMESTONE AND VOLCANIC ROCK:

Oneata	Thithia	Yathata
Kambara	Vanua Mbalavu	Ono-i-Lau (not seen personally)
Lakemba	Avea	
Katafanga	Malata	
Tuvutha	Susui	
Naisu	Thikombia-i-Lau	
Vanua Vatu	Naitamba	
Mango		

3. ISLANDS COMPOSED OF VOLCANIC MATERIAL ONLY:

Mothe	Kimbombo (2 of the 3)	These two are composed of bedded tuff.
Komo	Clorua	
Kanathea		
Munia		

4. FLAT SAND ISLANDS (No elevated limestone or volcanic material):

Naiambo
Yarona
Wailangilala
Mukutolu (3)

(The number of islands making up a cluster or group is indicated by the number in parenthesis).

[p.7]

132

AVERAGE RAINFALL IN LAU.

Month	MUNIA (H.H.Steinmetz) Average of 29 years to 1924	MUNIA (H.H.Steinmetz) Average of 28 years to 1923	NAMBAVATU Average of 5 years to 1924	NAMBAVATU Average of 4 years to 1923
January	7.64	7.86	7.36	8.29
February	7.67	7.77	7.79	7.58
March	9.05	8.93	9.41	9.61
April	8.46	8.59	13.08	15.50
May	5.31	5.17	5.72	5.52
June	4.36	4.35	2.67	2.63
July	2.80	2.69	-	2.70
August	3.91	3.82	5.06	2.01
September	3.51	3.53	4.91	4.46
October	-	4.94	-	4.01
November	-	5.58	-	4.38
December	-	7.11	-	11.08
Annual Average	-	70.33		77.28

1924 was an unusual year and upset the previous general average.

Figures obtained in October 1924.

[p.8]

SUMMARY OF THE POPULATION OF LAU.
From 1921 Census.

District	Island	Village	Pop.	Fijians Res.	Fijians Strangers	Others	No.of Houses.
Fulanga	Ongea	Ongea	101	92	9	-	21
	Fulanga	Munaithake	205	199	5	1	40
	"	Muanairo	41	41	-	-	12
	"	Naivindamu	64	64	-	-	12
Kambara	Namuka-i-Lau	Namuka	216	187	29	-	53
	Komo	Komo	140	115	25	-	25
	Marambo	Marambo	8	8	-	-	1
	Kambara	Lomati	46	42	4	-	8
	"	Nggalinggali	130	123	7	-	28
	"	Tokalau	109	101	8	-	19
	"	Undu	89	83	6	-	19
Mothe	Mothe	Leva	75	74	1	-	17
	"	Nasau	187	152	35	-	51
Oneata	Oneata	Dakuiloa	85	70	13	2	21
	"	Wainggori	138	128	10	-	23
Lakemba	Lakemba	Nasanggalau	151	127	23	1	29
	"	Nukumuku	70	63	6	1	17
	"	Tumbou	283	235	38	10	76
	"	Vakano	70	50	17	3	14
	"	Wathiwathi	130	112	17	1	28
	"	Waitambu	76	69	6	1	15
	"	Yandrana	187	177	8	2	46
	?	Levuka	87	83	3	1	17
Naiau	Naiau	Liku	59	56	3	-	14
	"	Narothivo	117	104	12	1	33
	"	Salia	146	108	34	4	28
Thithia	Thithia	Lomati	113	102	9	2	28
	"	Mambula	123	118	2	3	23
	"	Natheva	41	37	4	-	12
	"	Tarukua	75	67	3	5	17
	"	Natokalau	65	57	7	1	15
Lomaloma	Tuvutha	Tuvutha	102	96	6	-	22
	Susui	Susui	67	64	3	-	21
	?	Futuna	3	3	-	-	1
	Vanua Mbalavu	Levukana	71	67	4	-	18
	"	Lomaloma	151	113	29	9	38
	"	Narothivo	60	48	12	-	15
	"	Ndakuilomaloma	52	46	2	4	12
	"	Sawana	121	105	16	-	28
	"	Uruone	66	61	5	-	15
Mualevu	"	Malaka	14	9	5	-	5
	"	Navana	115	83	28	4	26
	"	Nboitathi	64	53	10	1	12
	"	Mualevu	196	151	45	-	37
	"	Muamua	30	20	10	-	8
	"	Ndalithoni	91	55	33	3	23
	Avea	Avea	63	53	10	-	20
	Thikombia	Thikombia	51	39	10	2	12
Ono	3 islands	5 villages	641	613	23	5	?
Matuku	Matuku	7 "	648	573	74	1	163
Moala	Moala	8 "	667	645	20	2	133
Totoya	Totoya	4 "	474	431	39	4	88
"	Vanua Vatu	Taira	162	145	15	2	28
			7402	6583	743	76	--#

1487 houses exclusive of those in Ono district.

[p. 9]

ONGEA ISLANDS

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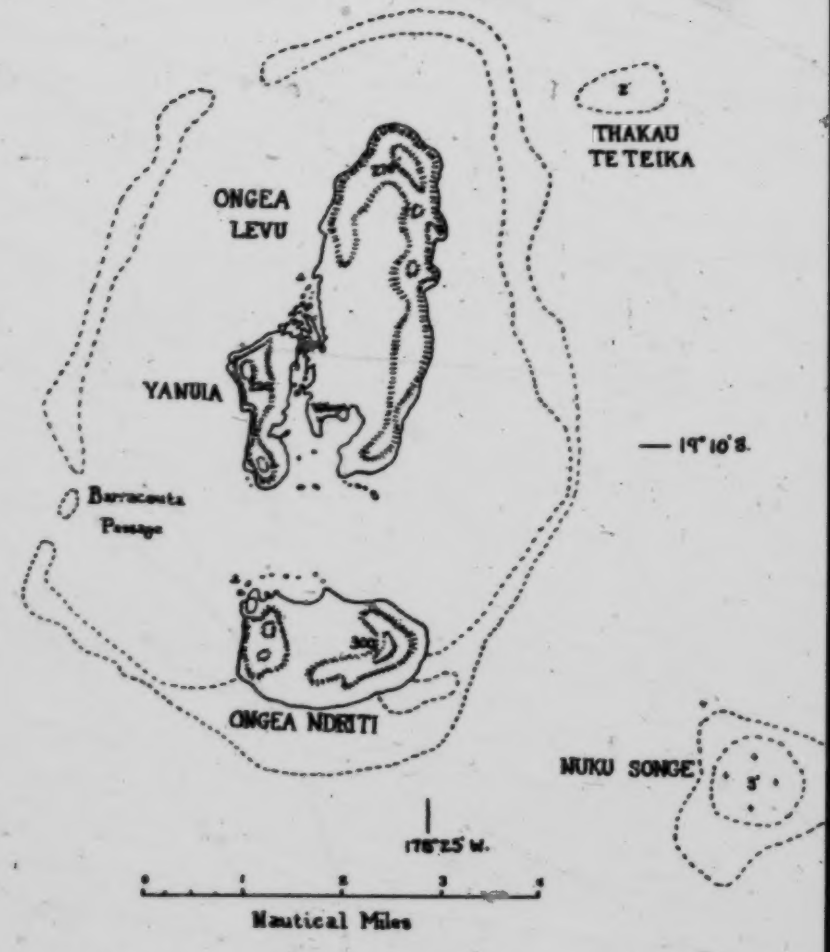

[p. 10]

9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

[ONGEA ISLANDS]

Unmapped Channel Between
Ongea Levu & Yanuia.

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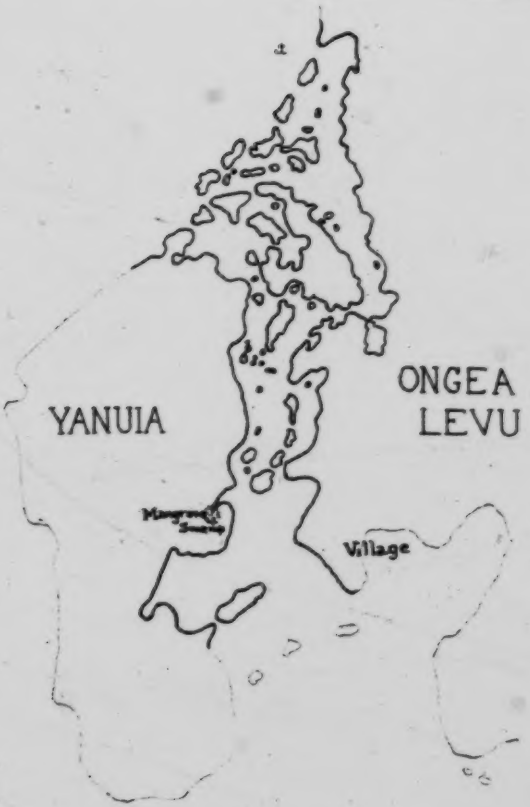

[p. 11]

13 1. ONGEA Islands consist of three limestone islands situated at the south-east end of the group; (S.19° 10', 178° 25' W.). They are encircled by a barrier reef 5 1/2 by 8 miles, thru which there is one good (Barracouta) passage on the west side.

Ongea Levu, the largest of the three, is elongate eliptical in outline, 3 1/2 by 1 1/4 miles, with a deep sandy bay on the south, [361] at the head of which is located the village. The central portion is a flat, rising to a height of 270 feet on the east in a nearly continuous line of hills facing the sea, and sloping up slightly to the west and north.

The south-west portion of this main mass is a separate island, called Yanuia, which is separated from Ongea Levu by a narrow, winding passage, nearly dry at low tide. It is hilly and rough, with an elevation at the north-west of 220 feet, rising sharply from the sea. The south-eastern portion is much indented and filled with mangrove swamps. Both ends of the passage are filled with small rocky islets, a line of which also fringe the south coast of Ongea Levu and the shore line of Ongea Ndriti.

Ongea Ndriti, which lies about a mile to the south of Levu, is ovate in shape, 1 3/4 by 1 1/4 miles. The eastern and western ends are rough and hilly, rising to an elevation of 300 feet. The north center is a partly cultivated flat, and there is a broad sand beach on the south.

All three of the islands are of typical upraised coral limestone formation, and are covered with a dense growth of lowland forest. Most of the sea face is steep undercut cliff, but there are several small sand beaches.

The best anchorages for vessels of moderate size are off the north-west end of Ongea Ndriti, and off the north end of the deep bay on the west side of Ongea Levu. At both of these landing is good.

[p.12]

[ONGEA ISLANDS]

13 From the latter[1] a good trail leads across the central flat to the [987] village. The bay on the south side of Ongea Levu is too shallow for vessels larger than small cutters to enter.

317 There is no fresh water other than rainwater which is caught and stored in a cement cistern at the village.

136 No wild animals other than rats, lizards and snakes occur on these islands. There is a large green lizard called "vokai" by the natives, and one (perhaps two) species of gray-brown snakes. The natives report wild goats, but neither they nor their tracks were seen..

361 [161] 241 All the inhabitants, about 100 in number, live in the village on Ongea Levu, but they cultivate considerable areas on both Levu and Ndriti. The principal products raised are manioc, sweet potato, 245 yams, taro and bananas. The cocomut groves are not so extensive as the area of the islands would permit, but they apparently produce sufficient copra to supply the humble wants of the natives. 181 144 320 285 287 231 The people are industrious and fairly intelligent despite their isolation. There is a more or less distinct Tongan cast. Wood carving, mat weaving and tapa beating are carried on to some extent, and numbers of canoes are cut in the thick woods. Pigs and a few fowl are raised, and dogs are kept as pets.

[1] [i.e.--anchorage on the west side of Ongea Levu. --analyst]

FULANGA I.

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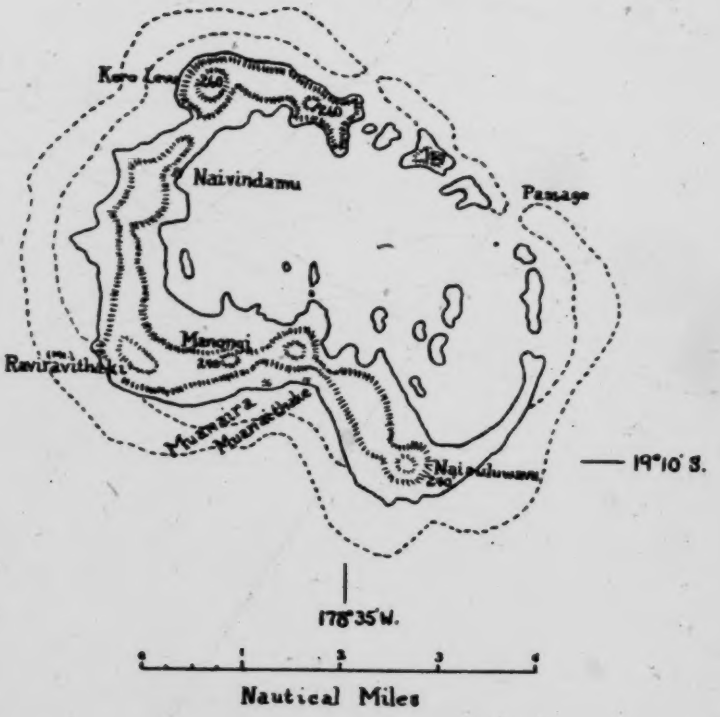

[p. 14]

13 2. FULANGA Island is a nearly continuous ring of uplifted coral limestone, eight miles directly west of Ongea Levu and south of the Yangasa Cluster, (S.19° 08', 178° 36' W.). It is 5 miles long (W.N.W.- E.S.E.) and 3 to 3 1/2 miles wide. The main island, which extends around three-fourths of the circumference, is from 1/4 to 1 mile wide, and reaches an elevation of 260 feet at the north-west and from 200 to 240 feet on the south. The remaining forth consists of a curve of small islets, one of which is 150 feet high. The hills on the south form a nearly continuous ridge, but those on the north are more prominent because of their isolated abruptness. The enclosed lagoon contains several fair size islands and a quantity of small mushroom-shaped rocks (too small to be indicated on the map).

This ring of land is surrounded by a barrier reef which is fringing on the S.E. and S.W. Thru it there is one passage, available for small vessels, on the N.W. side. This passage is but 60 yards wide with a strong tidal current flowing thru it at about 3 knots, and causing riffles and overfalls dangerous to small vessels, which should not attempt the passage when tide and wind are opposite in direction. A patch of coral just inside the entrance should be carefully avoided, by running close up to a small rocky islet covered with native palms, keeping on its west side, and then turning abruptly south-west.

The lagoon furnishes shelter from all points of the compass. A good anchorage is available at about the middle of the south side, off a small sandy bay where there are generally a number of native canoes on the beach. From here a trail leads over the ridge to the two southern villages.

[504]
[987]

[p.15]

[FULANGA I]

312 Water is available only at the villages where rainwater is caught and stored in cement tanks.

13 The limestone hills are thickly covered with the usual lowland forest. The flats on both sides support extensive groves of coconut palms and cultivated areas. Mangrove thickets border the S.W. side of the lagoon.

The animals include birds, rats, lizards and probably snakes, although none of the latter were seen, except the banded water snake. [231] The natives have domestic fowls, pigs and dogs. Mosquitoes present.

361 There are three small villages on Fulanga. Nnnaithake and Mnanairs are close together on the south ocean side. The former [161] has a population of about 200, living in 40 houses; the latter is much smaller, about a dozen houses and 40 inhabitants. Naividamu is situated on the N.W. arm, on the lagoon side. It has a population 487 of 64, living in a dozen huts. The three villages are connected by a good path.

181 The people appear prosperous and fairly industrious. The women 462 catch fish and dive for shell fish and oysters within the lagoon. The [226] men do the reef fishing and cultivate the fields. Canoe making and 241 some carving is done, and the women weave mats and beat out masi (tapa). [320] [285] Some little copra is cut and shipped and the usual crops of sweet [287] potatoes, yams, manioc and bananas are grown, the latter for local 295 consumption only. 241

9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

NAIAMBO I.

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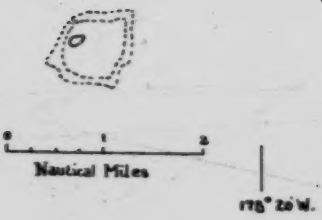
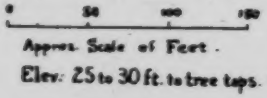
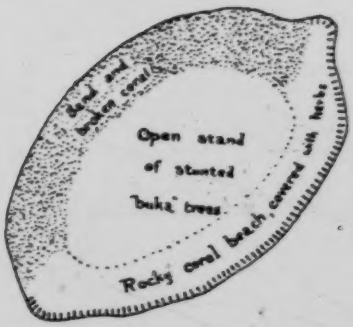




Elev. 25 to 30 ft. to tree tops.



[p. 17]

13 S. NAIAMBO is a very small, flat, sand and coral islet, about 150 by 250 feet, surrounded by a nearly square reef, less than a mile across. It is ten miles north of Ongea Levu and six miles east of Yangasa Levu, with two small patches of reef to the south and one small and one large reef to the north-west. (18° 57'30" S, 178° 22' W.) It is recorded as being 40 feet high, but is in reality scarcely 30 feet to the tops of the trees.

There is a narrow, winding passage thru the reef off the north end of the island, thru which row boats can enter at moderate or high tide. No anchorage.

[312] No water on the island.

The west side is bordered by a beach of sand and broken coral. The east side has a rocky beach covered with low herbs: Portulaca, Sesuvium and Boerhaavia. The central portion of the island is flat, more or less sandy, and covered with an open stand of stunted "buka" trees (Pisonia ?), 8 to 15 feet high, abruptly truncated on top by the wind and salt spray, and full of nesting boobies. A colony of frigate birds were nesting in the herbs on the south-east side.

The largest land animals besides the birds consisted of geckos, skinks and hermit crabs. Insects included red and black ants, several species of small flies, a robust Sarcophagid fly, small moths, a pale brown cricket, small beetle, mites, crustacia isopod, and spiders.

[223] [484] No sign of inhabitants, although the islet is occasionally visited by natives for birds. No coconut palms.

[p. 18]

YANGASA CLUSTER.

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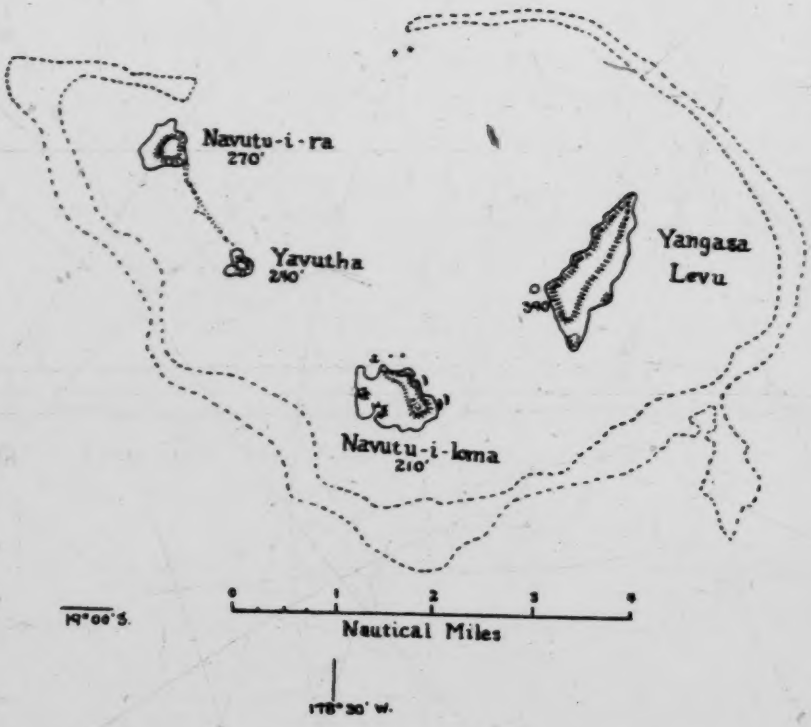

[p. 19]

13 4. The YANGASA CLUSTER (pronounced Yang'-a-sas) is made up of four small uninhabited limestone islands, within one lagoon 8 by 6 miles, protected by a subcircular barrier reef which has a two mile break on the north side. They lie about 12 miles north of Fulanga and Ongea Levu, the center of the lagoon being S.18° 56', 178° 29' W. [423] The group is said to belong to the people of Mothe, who gather the [245] copra from several small patches of coconut palms. [484]

YANGASA LEVU, the largest island of the cluster, is 1 2/3 by 1/2 mile, triangular in shape, with a central plateau, 390 feet high. The slopes and plateau are exceedingly rough and heavily wooded, but there is a comparatively level, smooth bench on the east side with a few coconut palms in addition to open woods. The west slope of the plateau rises percipitously from the water, but on the east the slope can be climbed in places. No beaches, but landing is possible on the west side of the south point, near which there is one small pool of nearly fresh water, surrounded by a grove of coconut palms.

NAVUTU-I-LOMA, the southern islet of the cluster, lies about 1 1/2 miles to the south-west of Yangasa Levu. It is irregularly oval in shape, 1/2 by nearly 1 mile. The surface is densely covered with lowland forest and for the most part exceedingly rough. On the N.E. side a ridge rises to a height of 210 feet. On the S.W. the land is low with deep bays choaked with mangrove swamps. The central portion is flat. A small bay with sandy beach offers good landing at the N.W. point. Opposite this bay the anchorage is good. There are other sand beaches and three small crescent shaped islets on the N.E. side.

YAVUTHA lies 1 1/2 miles to the N.W. of Navutu-i-loma. Though little more than a quarter mile in diameter it reaches an elevation of 240 feet in a sharp peak on the S.E. It is densely wooded with the usual lowland forest and has quite a grove of Casuarina trees on

[YANGASA CLUSTER]

13 the N. and N.E. slopes. There are no beaches. Landing is possible in smooth weather on the west side.

NAVUTU-I-RA , a mile further to the north-west, is 1/2 mile in diameter and 270 feet high. It is connected with Yavutha by a narrow sunken reef on which are situated a number of small rocks. The slopes of this island are quite rough, but there is a small, nearly level flat on the N.W. Both flat and slopes are heavily wooded. A small sand beach on the south side makes landing easy.

[312] There is no fresh water on the three smaller islets, and only the one pool noticed on Yangasa Levu.

Snakes are abundant and rats are probably present. Lizards and hermit crabs are [illegible] numerous.

These limestone islands have an exceedingly rough surface, which warrents the nick-name "bad-lands". This consists of jagged ridges (or rather hummocks, as they lead nowhere), separating pot-holes up to 50 feet in diameter and often 15 to 25 feet deep. The walls are ah eer and unbelievably rough and jagged, ruining shoes, clothes and skin. This type of country, however, is well forested.

[p.21]

NAMUKA-I-LAU

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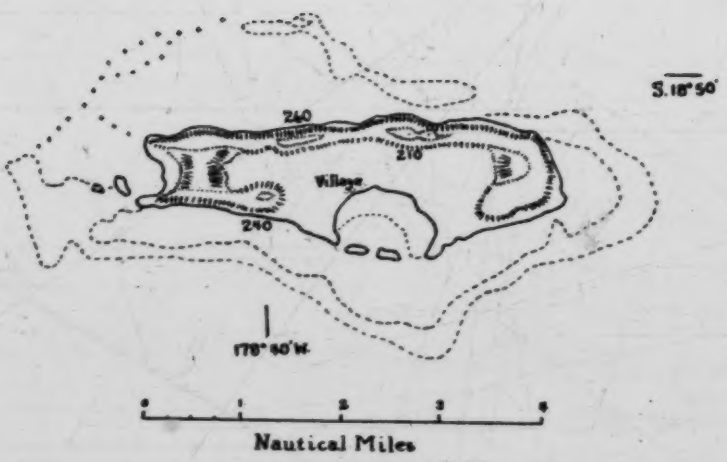

[p. 22]

13 [361] 5. NAMUKA-I-LAU lies about 8 miles N.W. of the Yangasa Cluster. (Village: S.18° 51', 178° 38' W.)It is rectangular in shape, a little over 4 miles long by 1 broad, and composed of coral limestone. A barrier reef, reduced to a chain of coral heads on the N.W., surrounds the island. On the north side of the island a rough ridge of upraised coral limestone rises abruptly from the sea to a height of 260 feet, and on the S.W. there is a short ridge up to 240 feet high. [361] The village is located on a large bay facing the south, and another sandy bay is located at the west end. Each contains two small islets. The interior is a flat covered with extensive groves of cocoanut palms and cultivated areas. Along the ridges and at each end is lowland forest. There is a small marsh near the village.

The south bay is shallow and inaccessable. Good anchorage may be had within the reef off the north side. A trail leads over the [487] ridge from a landing situated half way between the highest peak (260') and a more conspicuous double peak (210'), near a cocoanut grove.

[312] Rainwater is caught and stored at the village.

No land snakes, but water snakes are to be found occasionally on the rough coral beaches. Rats, hermit crabs and lizards are present. Mosquitoes and dragonflies ~~[illegible]~~ numerous.

361 161 The village is of moderate size, with over 50 houses and a population of about 216. The inhabitants are industrious and prosperous 181 245 241 177 287 322 366 cutting a large amount of copra and farming extensive cultivated areas. There is a Chinese store. There is considerable beating of masi (tapa), but very little carving.

[p. 23]

MOTHE & KARONI

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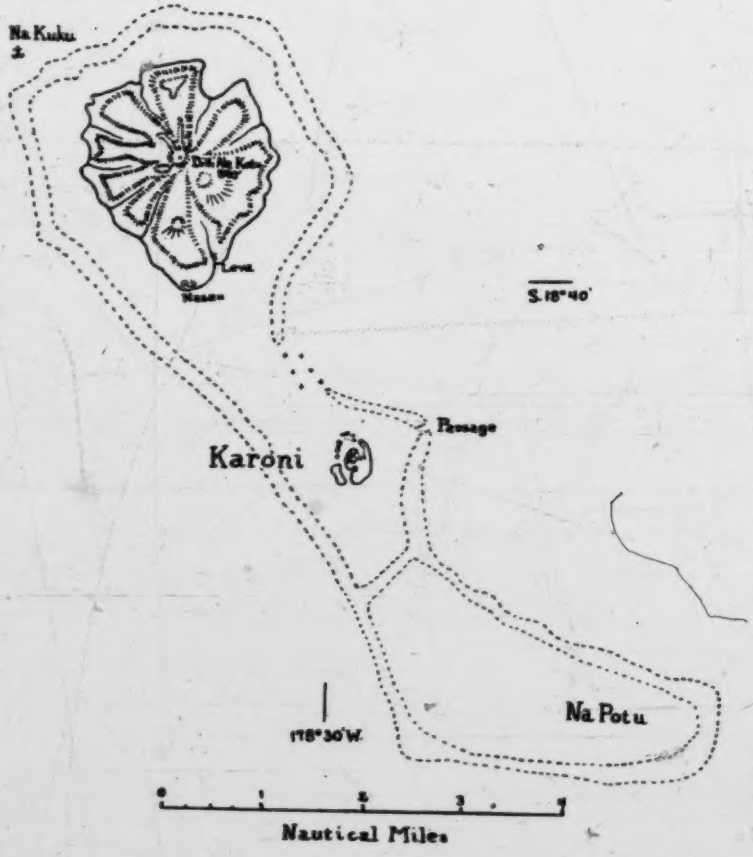

[p.24]

13 6. MOTHE is a moderate size volcanic island, 18 miles north of the Yangasa cluster and 12 miles N.E. of Namuka-i-Lau. The barrier reef which surrounds it stretches 7 miles to the south-west in a sweeping horn called Napotu, and also encloses a small limestone island, Karoni.

Mothe is 2 1/4 by 2 miles, with smooth, brown, grassy slopes rising to 590 feet in a tree capped peak, Dilli Na Kotu. These slopes are cut by several deep valleys, in which flow small streams of murky water. The beach and valley bottoms are lined with littoral and lowland trees and groves of coconut palms. Much of the beach is sandy. There is a wide, flat reef fringing the south and east sides.

Small cutters can enter the lagoon by a passage near the middle of the east side, east by north from Karoni. For larger vessels there is good anchorage (called Na Kuku) off the N.W. end of Mothe (outside the reef).

Besides the grass there is considerable scrub, ferns, and scattered Pandanus and Casuarina trees on the hills. The summit forest tuft consists of lowland trees only, which have worked up the valleys.

Animals, other than birds, include rats, lizards and banded water snakes.

361 There are two villages: Nasau, the larger, on the south point, and Leva or Na Koro a scant half mile up the east coast in a small bay. Both are surrounded by extensive groves of coconut palms. 226 There is much fishing, a little cultivation, and some masi beating 241 and mat weaving. Pigs and fowl are raised. 286 285

Karoni is 2 1/4 miles south south-east from the south point 231 of Mothe. It is a typical rough limestone island, supporting a 13 thick growth of trees. The main island is sub-circular, but a number of small islets complete the circle. The east and south sides

[KARONI I.]

13 are low with deep indentations and mangrove thickets. The north-west end rises abruptly from the water in a 120 foot hill, which also slopes steeply on the land side.

There is one small grove of coconut palms. Lizards, snakes and hermit crabs are present. White terns numerous in addition to the usual birds.

484 The island is uninhabited, but is occasionally visited by the
161 natives of Mothe, especially for timber, there being a trail cut
313 into the interior.
487

[p.26]

OMEATA I.

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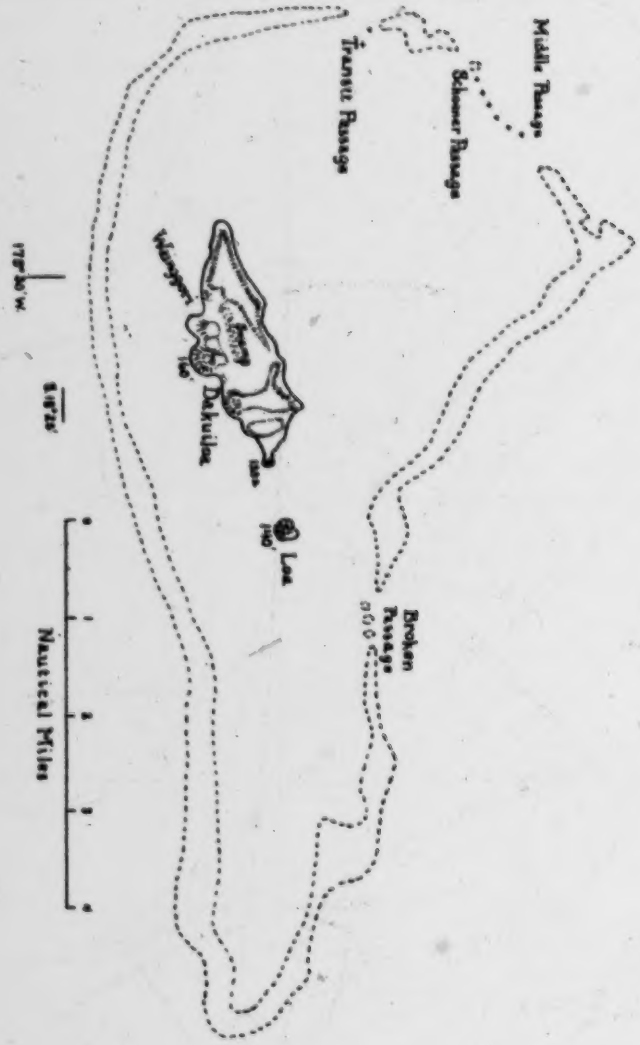

[p. 27]

13 7. ONRATA is a partly coral limestone, partly bedded sandstone island, lying about 12 miles north of Mothe. (S.18° 25', 178° 30' W.) It is 2 1/2 miles long and about 7/8 mile wide, pointed at both ends, and with three small wooded peaks up to 160 feet high on the south-east. Toward the east end there are two cross-ridges covered with forest. Off the east point a small conical islet, Loa, rises to a height of 140 feet. The west end has a sandstone hill, covered with grass, scrub, Pandanus and Casuarina. A volcanic ledge borders the east point. The central portion of the island is occupied by a narrow brackish swamp. South of it (between the two villages) are to low knobs or ridges of sandstone. On the north side of the low central depression is a large area of coconut palms and cultivated patches.

The island is surrounded by a long triangular barrier reef, extending six miles to the eastward and four to the north-west. Thru it there are four passages, three on the west and one on the north. The water is moderately deep within the lagoon, except off the S.W. point of the island. There is good anchorage off the main village, Wainggoti, in the S.W. bay.

312 Water is abundant. It is piped to Waing-gori from a spring in the west end sandstone hill, which is said to run all year round. There is also a fresh water bathing pool near the swamp. Rainwater is caught at Dakuiloa, the other village.

13 In addition to the usual lowland and littoral trees, noted "yasi" sandlewood. Land birds numerous, but no water birds seen. No snakes reported. Aquatic insects numerous, and mosquitoes very troublesome.

361 There are two villages, Wainggori (Waigori) and Dakuiloa, both
[161] situated on the south side. The former claimed a population of 250 although the 1921 ~~census~~ census gives the figure 138. There were

[ONEATA I]

361 certainly more than the reported 25 houses. Dakuiloa is much smaller,
[61] with 21 houses and 85 people. There is a store at each village,
366 Chinese at Wainggori, Japanese at Dakuiloa. The people seemed
179 friendly, courteous, generous and sincerely religious. There was a
181 noticeable Tongan element.
194

241 Quite a little agriculture is carried on by the natives, good
corn (maize) being raised in addition to the usual sweet potatoes,
181 yams, manioc, taro, bananas, and pumpkins. The people are prosper-
285 ous and industrious. Some little mat weaving, masi (tapa) beating,
287 and wood carving is done.
322

[p. 29]

9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

OLOSUA & KOMO

Detail of Olorua.

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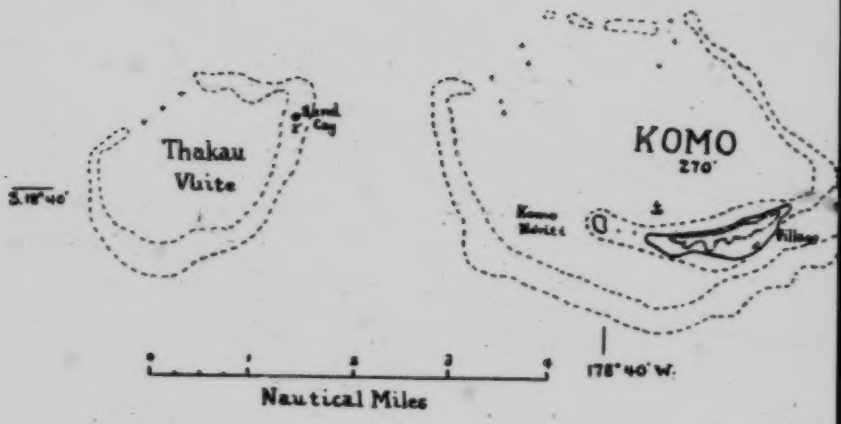

[p.30]

13 T. KOMO is a small island of volcanic origin lying 9 miles north of Nammka-i-Lau and 6 miles west by south of Mothe. (S.18° 41', 178° 59' W.). It is sub-crescent shaped, 1 1/2 miles long by 5/8 mile wide. On the north a ridge rises to an elevation of 270 feet from the sea, with moderately steep slopes; covered with grass, scrub, Pandanus and Casuarina trees. The summit is crowned by a small patch of coconut palms. The south side and west end are flat with cultivated areas and small groves of coconut palms.

Komo Ndriti, a small, rough, wooded islet of upraised coral limestone, lies a half mile off the west point.

A barrier reef encloses these islands on three sides, the northwest being open except for coral heads and a few small patches of reef. Here there are two good ship passages, 320 and 550 yards wide.

312 Although there are one or two small murky streamlets, rainwater is caught and stored in the village for drinking purposes.

13 Birds, lizards, rats and hermit crabs are the only wild land animals. Insects not very abundant and landshells scarce.

361 The village is located on the S.E. side, and consists of about 25
[161] houses. The natives, about 140 in number, are great fishermen, the
226 women using hand nets and basket traps, plated from beach vine, near
227 shore, while the men fish on the reef. They raise a few domesticated
462 pigs, fowl and dogs. Some little cultivation is done, especially of
231 sweet potatoes.
241

[p. 31]

13 9. OLOKUA is a small islet of volcanic material, 8 miles N.W. of Komo, surrounded by a semi-frigging reef. It is about 3/8 mile long by 1/4 mile wide, with three hills, the southern one of which rises 250 feet. The west side has so eroded as to disclose an interesting formation of bedded tuff, which slopes outward and downward from the center. The hills are covered with a very open stand of small trees, between which are areas of grass or bare ground strewn with weathered lava rocks.

Near the middle of the east side a depression or mineature valley, with a trickle of marky water, holds a patch of cocomut palms. Another small grove is located directly across the low divide on the west side, and there are a few palms on the S.E. end.

Birds are numerous, including barn owls and ground doves. Lizards, hermit crabs and probably rats present. Insects and landshells very few.

245 [161] 484 There are no inhabitants, but copra is gathered, probably by the natives of Komo.

[p.32]

KAMBARA, MARAMBO, WANGAVA
nand TUVUNASITHI.

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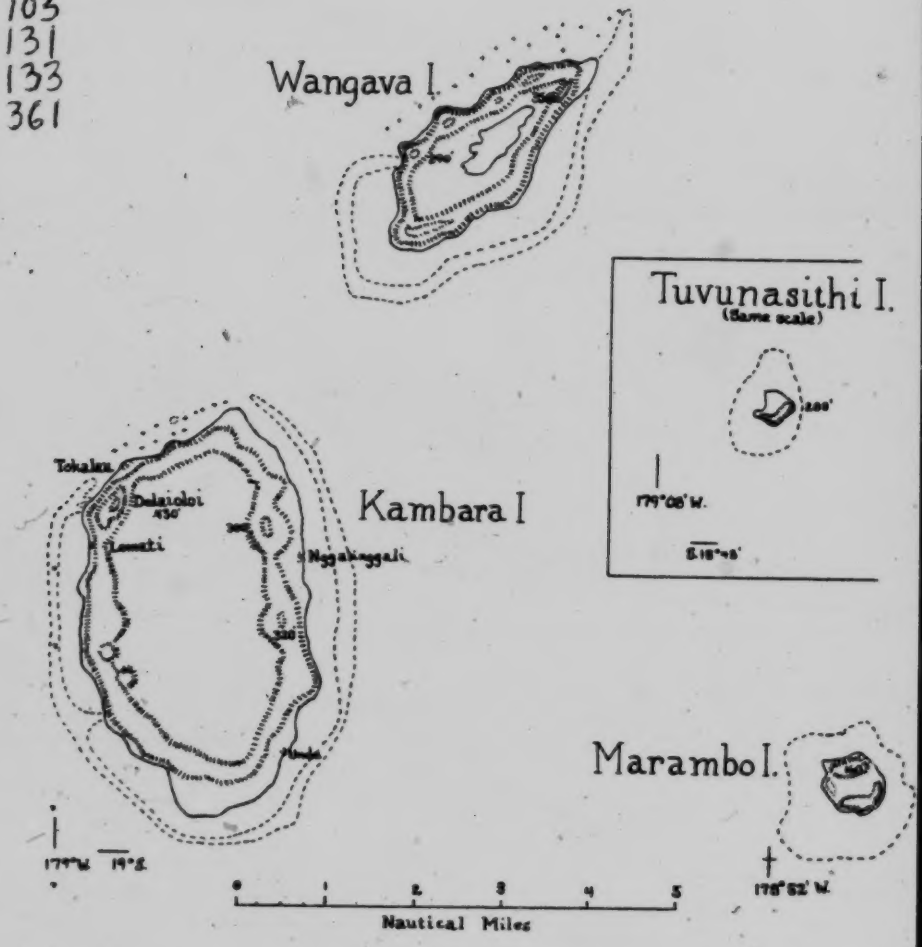

[p. 33]

13 10. KAMBARA is a moderately large, ovate island of upraised coral limestone with a volcanic intrusion at the N.W. end. The island is situated at the S.W. corner of the Lau group. Its south end rests upon the 19th parallel south and its west reef touches the 179th meridian west. It is 4 1/2 miles long and nearly 3 miles wide.

The greater part of the island is a wooded basin, surrounded by a continuous ridge of upraised limestone, up to 550 feet high, which drops abruptly toward the sea. The highest peak on the island, Delaioloi, is of volcanic material, 470 feet high, at the N.W.corner.

There is no harbor, but anchorage in 12 fathoms, sand and coral, may be had with the usual E or S.E. wind, off the N.W. corner, opposite the village of Tokalau. Landing is easy. At this point the barrier reef which surrounds the island is reduced to a line of coral heads.

[312] Water is not abundant on Kambara, but small supplies might be obtained at the villages, where rainwater is caught and stored in cement tanks.

[241] Part of the N.W. end of the central basin has been cleared of forest and planted to sweet potatoes, yams, manioc, pumpkins, bananas and other native foods. The remainder of the basin is covered by a thick, tropical, "lowland" forest. Along the N.W., N.E. and S.E. sides the beach is a sand flat underlain by corse sandstone and covered with groves of coconut palms and the usual beach growth. Portions of the N., W. and E. sides are percipitous undercut cliff.

The familiar land animals; crabs, lizards and rats present. No snakes seen, although the natives report them present.

361 There are four native villages: Tokalau, at the N.W. corner with
[161] 109 natives; Lomati, about a mile down the W. coast, is a small, but
[368] clean and prosperous looking village with an attractive church and
[161] 46 natives; Undu, at the S.E. end, situated in an extensive coconut grove, with 89 inhabitants; and Nggalinggali (Qaliqali), the largest

[p. 34]

[KAMBARA I.]

361 [161] of the four, on the east side, a little north of the middle, with 150 residents. A trail leads across the basin from the latter to the 487 241 garden areas, which seem to be cultivated jointly by the people of the three northern villages.

With the extensive timber at hand, the natives of Kambara have 396 long been noted for their canoe and boat building as well as for 322 various kinds of carving.

13 This is the largest of the dominately limestone islands and would be well worth concentrated collecting.

[p. 35]

13 11. MARAMBO Island is a small, nearly circular limestone island located 7 miles east of the south end of Kambara. (Lat.18° 59', Long. 176° 50' W.) The surrounding reef is fringing in character, about 1 1/2 miles on a side. The island is about 1200 yards in diameter, with a rough flat topped hill on the north, "160" feet high (nearer 200 feet), the summit having a densely wooded depression. Between this hill and the west beach, where there is a low ridge, is a small flat, wooded and with cocomut palms. South of the hill is a broad area of rough "badlands".

There is no anchorage, but landing is good thru a gap in the reef on the north side, leading to a broad sandy beach.

[312] No fresh water noted.

The surface is covered with the usual thick lowland forest, and the sand beach has an extensive growth of cocomut palms and beach plants, especially at the N. and S.W. ends. The usual birds and small crabs and lizards present.

361 The island is uninhabited most of the time. There are four
245 tumbled-down huts on the west side which are occasionally used by the
484 Kambara natives when gathering copra. The 1921 census gives a pop-
161 ulation of 8. At the time of our visit (Aug.26,1924) one of the huts
484 was occupied by a man and two boys, stranded en route from Komo to
241 Fulanga. Most of the island is too rough for cultivation, but in addition to the two groves of cocomut palms there is a small cultivated area toward the S.W. end.

[p.36]

13 12. WANGAVA island is of rough upraised coral limestone formation, 5 miles N.E. of Kambara. It is shuttle-shaped, 3 1/2 miles long and 1 mile wide. The island is surrounded by a rough marginal limestone ridge, rising steeply from the sea to 350 feet, enclosing a basin, much of which is occupied by a brackish lake. This lake is much more extensive than shown on charts of the island, being over a mile long and filling the entire N.E. two-thirds of the interior. The S.W. end is an undulating wooded plateau, with a few patches of coconut palms and wild lemon trees. There is also an extensive grove of coconut palms at the N.E. end of the lake, and small patches along its shore.

The rough, "badlands" of the surrounding ridge are covered with the usual lowland forest. The sand beaches have the usual littoral vegetation, including Erythrina indica, not seen on every island. The interior [139] contains plenty of good soil for cultivation, none of which is in use.

Landing is favorable on the N. side, where there are several sand beaches and the surrounding barrier reef is broken up into patches of coral heads. Anchorage may also be obtained here with an off shore 487 (E. to S.W.) wind. A trail leads into the interior from a sand beach 312 at the N.W. end. No fresh water seen.

361 The island is uninhabited, but there are some huts on the N.W. 161 beach, used by natives from Kambara, collecting copra. In the interior 295 trees have been felled in places. 484

[p.37]

13 15. TUVUNASITHI is a very small island of upraised coral limestone, 13 miles N.W. of Wangava and 25 miles S.W. of Olorua. It is sub-circular in outline, 1/2 mile in diameter, and rises in a steep, crescent shaped ridge on the east side to 200 feet elevation. It is surrounded by a fringing reef with no entrance. The S. and E. sides are rocky, the N. and W. sandy. The east ridge and west flat both consist of well forested coral "badlands".

There is no anchorage. Landing is possible on the N.W. side at half tide or higher; a small break in the reef giving access to a sandy basin from which the sand beach may be reached.

[312] There is no fresh water.

There is the usual littoral vegetation, the north and west beaches having more Pemphis than usual. There are small clumps of coconut palms.

295 161 361 The island is uninhabited, but the copra is collected and there is a small hut on the N. beach.

[p. 38]

9s Bryan N-5 (1924) 1924 OQ6 Lau OQ6

AIWA ISLANDS

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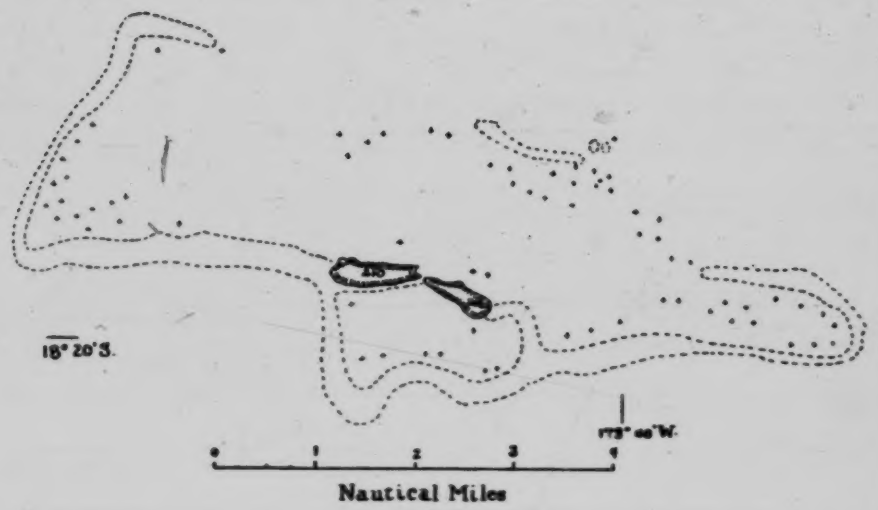


[p, 39]

13 14. AIWA ISLANDS. Two small uninhabited islands of upraised coral limestone, about 12 miles S.E. of Lakemba. (18° 20' S., 178° 41' W.). They are each about a mile long by 600 ~~yards~~ yards wide, lying in nearly a straight line, with their ends close together and connected by a sunken reef. An elongate barrier reef extends out from each side for 3 or 4 miles, being continuous across the south side, but reduced to broken patches and coral heads on the north. The islands rise abruptly from the water in rough undercut cliffs to a height of 150 to 200 feet, but they are comparatively flat and even on the tops.

Anchorage may be had on the N. side of the western island, there being a broad clear entrance to the lagoon on the N.W. Landing is good in a small sandy bay at the east end of the western islet. It is more difficult, but possible, on the eastern islet, in places along both the N. and S. sides, the latter being better at low tide.

There are numerous caves in the limestone walls, and one large broken in cavern in the east central portion of the western islet, at the bottom of which there is a pool of brackish water. There is no [312] fresh water on the islands except immediately after rains, when a little rainwater collects in open depressions.

The interior flats are covered with the usual lowland vegetation, open and park-like. There is a patch of introduced weeds and a few cocoanut palms near the sand beach on the western islet. On the eastern islet there is a small area of reed or <u>nasau</u> grass, with Pandanus trees. There is no cultivation.

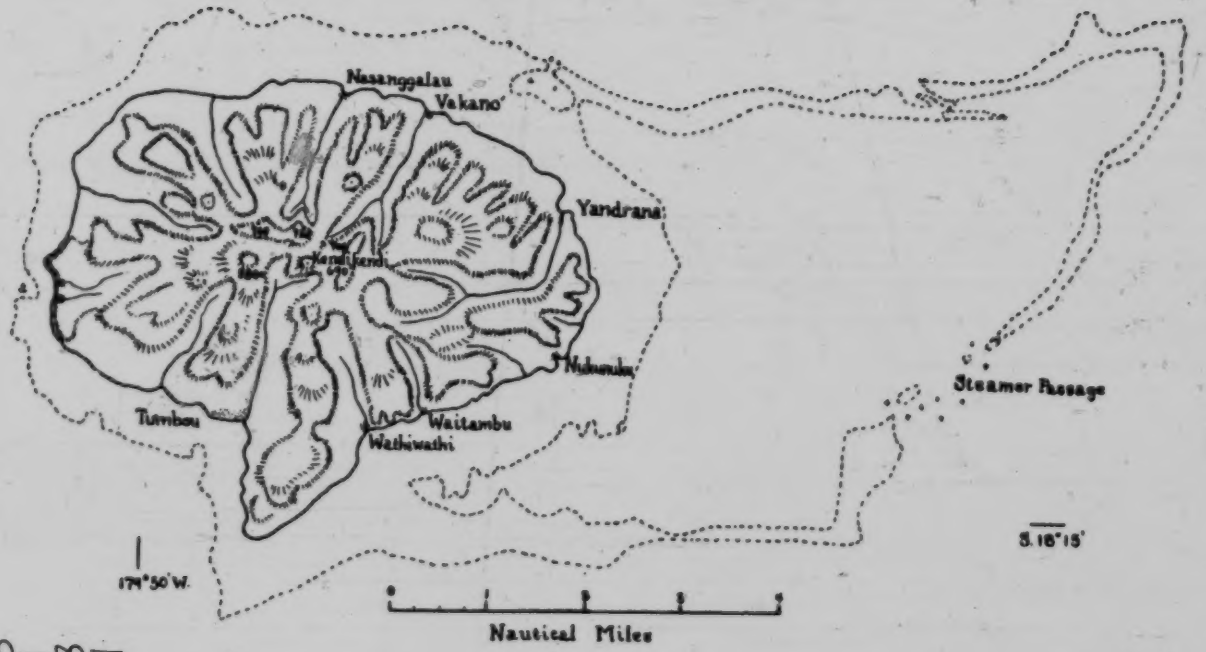
native
[423] A flock of goats was placed on the islets by the late owner, a chief residing on Lakemba. There are the usual birds, lizards, crabs and 484 snakes. The islands are occasionally visited for copra and goat hunting. 295 224

[p. 40]

OQ6 Lau OQ6

9: Bryan N-5 (1924) 1924

LAKEMBA I.



[p.41]

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13 15. LAKEMBA is a large volcanic island located at approximately the center of Lau, (18° 12' S., 178° 47' W.). It is nearly oval in outline, 5 1/2 miles east and west by 3 1/2 miles north and south, with a wooded limestone point extending south another mile from the center of the south side. The interior is high, rounded and grassy, with numerous radiating valleys, and several peaks, all of about the same height, up to 720 feet elevation. At the N.W. end there is a conspicuous, wooded, flat-topped peak of upraised coral limestone, rising percipitously to a height of about 400 feet.

There is a well situated harbor for small craft on the S.W. side, off the village of Tumbou. It is difficult of access, thru a 30 yard entrance, because of the tide rip. Larger vessels can find anchorage within the lagoon formed by the barrier reef which extends several miles to the eastward, there being an entrance on the south-east. The island is surrounded by a fringing reef. There is an anchorage outside the reef off the west end, with an off-shore wind. On the north side the reef dries at about a quarter tide, forming a broad mud flat.

[317] Water is abundant and fairly accessable. There is a stream in every valley, and also a convenient pool on the beach near the west end anchorage, behind which rises an elevated limestone bluff. Supplies [366] may be obtained both at Tumbou and at a store near this west end pool.

The hills are covered with reed (or nasau grass), Pandanus, scrub, [241] and Casuarina trees. The valleys are fertile with extensive cultivated patches. A continuous line of coconut groves, together with other beach plants, fringe the shore. The limestone areas are well forested and on the east side, along the shore of the lagoon, there are extensive mangrove thickets.

Small animals and insects as on other islands of the group. The mosquitoes were abundant and troublesome. Quite a variety of bird life.

361 161 [99] Lakemba has seven native villages, Tumbou being the largest one in Lau, with a population of 283. The others in order as one goes counter-clockwise along the well kept connecting road are:- Wathiwathi, on the east side of the south-jutting peninsula, 130 natives; Waitambu, three quarters of a mile to the east, 76 inhabitants; Bukunuku at the S.E. corner of the island, at the head of a small bay, 70 natives; Yandrana, along the banks of a fair size stream, at the N.E. corner, 187 inhabitants; Vakano, about 2 miles to the N.W., 70 natives; and Nasanggalau, with 150 inhabitants, about a mile to the westward at the mouth of the next stream. The west end of the island, opposite the Wankatalatha anchorage, is privately owned. There is a small store, 423 366 197 run by Chinese in nearly every village, and a large store run by the Lau Traders, Ltd., at Tumbou.

181 439 295 241 287 The inhabitants are thrifty, intelligent and industrious, drying and exporting a large quantity of copra. There are extensive cultivated areas containing yams, sweet potatoes, etc., in the valleys. Considerable masi (tapa) is made.

799 871 Lakemba was the first island in Fiji to be Christianized by British Missionaries (1853). The Provincial School, to which boys from all over Lau are sent, is situated near Tumbou.

[p. 43]

Northern Portion of
MBUNATATANOA (or Argo) REEF
and details of VANUA MASI & BACON I.

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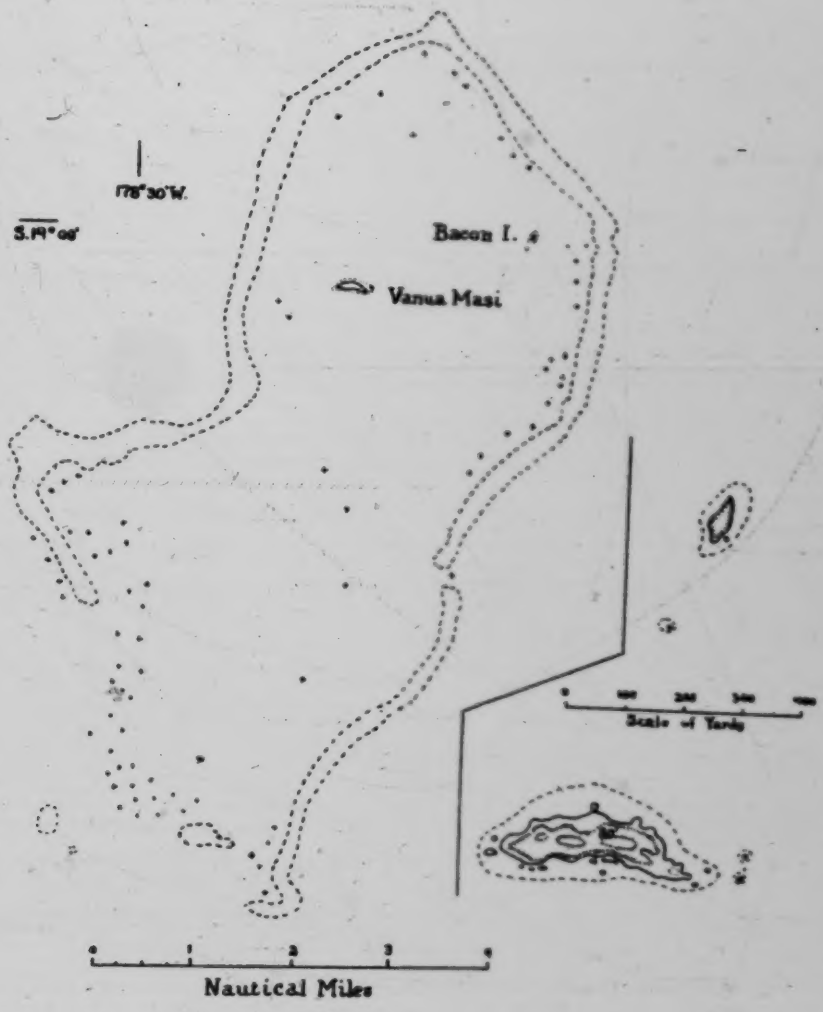

[p44]

13 16. MBUKATATANOA (OR ARGO) REEF, lying to the east and north-east of Lakemba, contains two small, uninhabited coral islets, near its north end.

Vanua Masi, the larger, is not as large as given in the U.S.Pilot Book (Vol. 166, p.377), being only about 400 by 100 yards, and probably less than 80 feet high. Anchorage is good off the north side of the island. Landing is easy on a sand beach on the north side, behind which is a small clump of coconut palms, bananas, papayas, and a few species of widespread littoral trees, all white with bird guano and stunted by wind and salt spray. The rest of the island is very rough limestone with a few shrubs, herbs and vines. Numerous outlying rocks on the platform-like reef, especially off the east end. The above dimentions include the fringing reef platform.

Insects abundant as to numbers, but few in species. Landshells under drift wood and coconut husks. Hermit crabs, lizards and water snakes present.

Bacon island, about 2 miles east, is 80 or 90 yards long (N.& S.), and less than 40 or 50 yards wide, tapering at both ends. It also is composed of jagged limestone, rising to a height of 45 to 50 feet. Small pockets of dirt on its steep sides, richly impregnated with bird guano, give growth to such herbs as Sesuvium, Portulaca, stunted bunch grass, and a small shrub.

Water snakes and lizards abundant in crevaces. Only half a dozen species of insects present, but abundant.

Both these islands are used as a nesting place by sea birds.

[p.45]

9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

REID REEF
Details of
Latei Viti & Latei Tonga.

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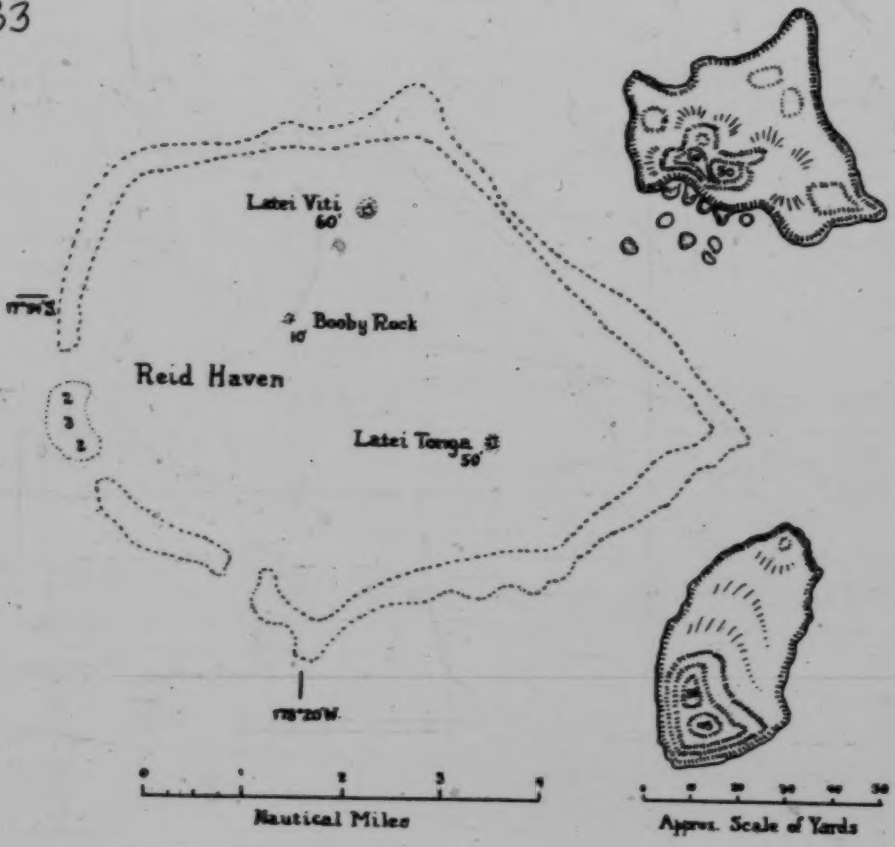

[p.46]

13 17. REID REEF, 4 1/2 miles north of Mbukatatanoa (or Argo) Reef, encloses a lagoon, Reid Haven, containing three coral rocks or small islets, which are nearly bare of vegetation, and are the resort of numerous sea birds.

Latei Viti, the largest of the three, is triangular in shape, about 50 yards on a side, and 60 feet high, of rough coral limestone. Its sides are so covered with bird guano as to appear whitewashed. Small terraces on the north and east have pockets of dirt supporting a small growth of such herbs as Portulaca and Boerhaavia. Lizards and water snakes numerous. About half a dozen species of insects. The south side rises in a steep cliff, at the foot of which are a number of detached and semi-detached rocks.

Latei Tonga lies about three miles to the S.S.E.. It is kidney-shaped, about 50 yards long by 30 wide, and attains a rugged height of perhaps 50 feet in a steep hill on the south. It is similar to Latei Viti in its white jagged cliffs. The north end is low, or with small patches of Portulaca, Sesuvium, Boerhaavia and a mat grass, rising in terraces toward the south. These terraces provide a nesting place for boobies and terns. There are also lizards, water snakes and red-legged hermit crabs. Insects, more numerous than on Latei Viti, include ants, dermestid beetle and small black beetle under dead birds; black agromyzid fly, greenish cranefly, and fuscous leaf-hoppers on the plants; 2 species of small weevils, a mite, and more ants among roots; some small moths and the booby hippoboscid fly.

Booby Rock is a small dark colored coral rock ten feet high, about a mile and a half south-west of Latei Viti. It is bare, even of birds.

[p. 47]

YAROUA I. and Adjacent Reefs.

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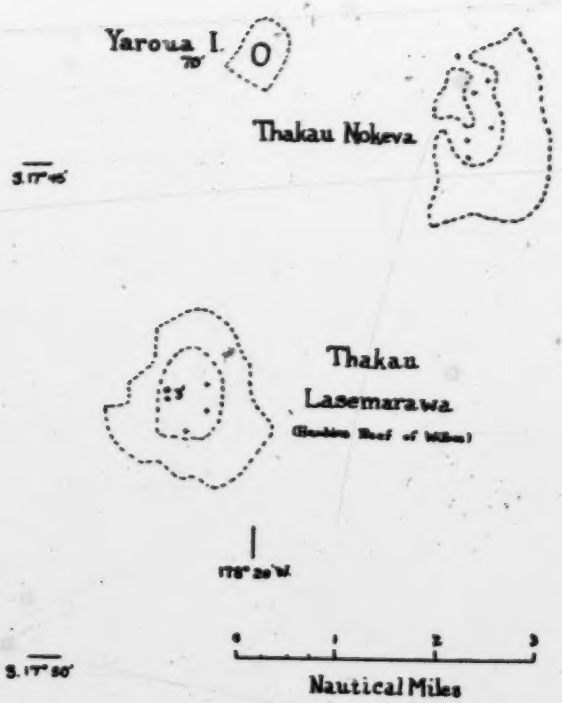

[p. 48]

13 18. YAROUA is a small sand island, nine miles east of the south point of Tuvutha' I. and 20 miles W.N.W. of Reid Reef. It is surrounded by a fringing reef, varying from 200 to 400 yards wide. The island is flat, smoothly oval in outline, about 500 yards long by 300 to 400 yards wide, and 70 feet to the top of the coconut palms, which thickly cover its surface. This vegetated portion is surrounded by a broad steeply sloping sand beach.

Landing would be possible at high tide off the N.W. point, but as wind and tide were unfavorable we did not stop.

[361] On the N.W. point are a few huts, which were occupied at the time of our visit. The coconut grove, which is similar to that on Wailangilala, should produce some little copra. There were no canoes on the beach.

The two reefs, Thakau Nokeva and Thakau Lasemarawa lie respectively two miles to the east and three miles south. The latter contains rocks rising to a height of three feet.

9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

KATAFANGA, VEKAI
Detail of Vekai.

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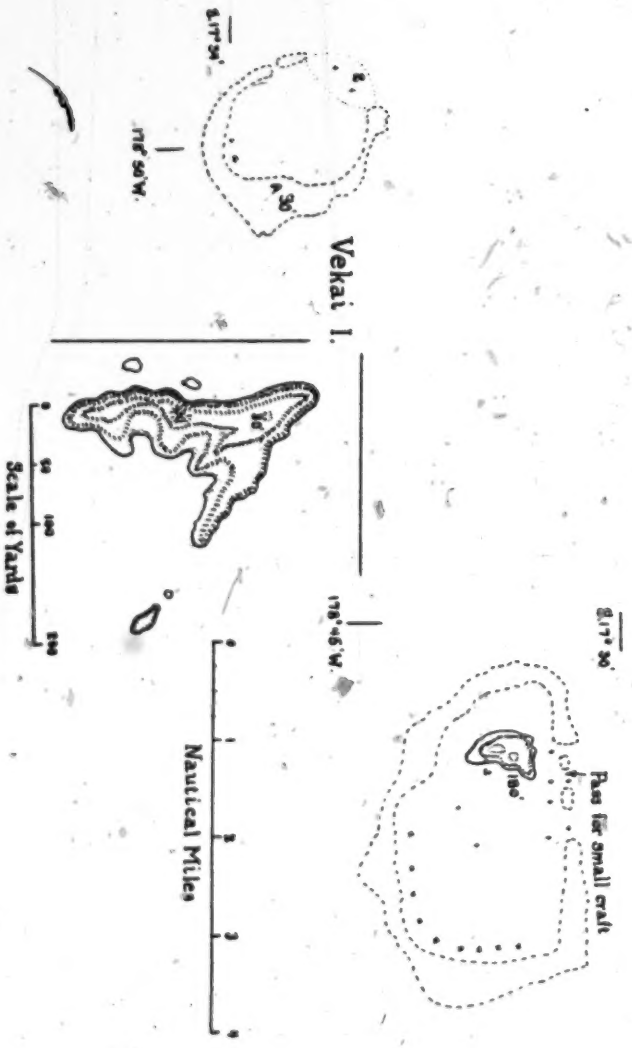

[p. 50]

13 19. KATAFANGA (or Katavanga) is a small island of limestone and volcanic material, lying 23 miles S.E. of Munia and 19 miles N.N.E. of Tuvatha'. (S. 17° 31', 178° 43' W.) It is 3/4 mile long and 800 yards wide on the north, tapering toward the south, and rises in two rounded hills to a height of 180 feet. The northern third of the island is densely wooded, rough upraised coral limestone; the southern two-thirds, rounded volcanic material, covered with grass and groves of cocoanut palms. The transition between the two is the most striking seen in Lau, as sharp as if cut by a knife. The southern portion is bordered by a broad beach of sand and slab sandstone.

The island is surrounded by a barrier reef thru which there is a passage on the north side which will admit small vessels drawing 10 feet or less. This passage is not the eastern one, generally indicated on charts, but the narrow one directly north of the N.E. point of the island. In it there are two or three coral heads, but with a favorable tide and commanding breeze small vessels may enter. A desirable
361 anchorage is to be had off the S.E. side of the island, opposite the owner's house, where landing is good.

423 The island is freehold property, owned by Mr. T.O.U.Stockwell, who
345 lives on the island and is engaged in ~~planting~~ producing copra. There is no
464 native population other than his six workmen. Water may be obtained
312 together with small supplies of yams, sweet potatoes, papayas, pigs, etc.
262 Bird and insect life abundant on this luxurient little island. The
13 usual lizards and land crabs present in some numbers.

[p.51]

13 20. VEKAI is a small coral islet, 30 feet high and about 200 yards long, situated on the east inner edge of a circular reef, six miles W1 by S. from Katafanga. The lagoon is about 2 miles across with a boat entrance on the N.W. side (2 fathoms). The islet is wedge-shaped, with small sand beaches in the S.E. bay. The west side rises perceptibly from the water, but the east slope is gradual, with small pockets running back from the sandy coves. These are filled with stunted trees (Tournefortia, Hernandia peltata, and Ficus), and herbs, vines and a shrub festoon the rough ridges. A small patch of burr grass has somehow been introduced. There are four small detached rocks situated nearby on the reef: one on the west, one off the south point, and two off a projecting S.E. point.

[312] No fresh water. Saw neither lizards or snakes, although both may occur. The white and brown Pierid butterfly is present and several other interesting species of insects.

This islet is especially interesting because it forms a transition between the nearly bare rocks such as Latei Viti and Bacon I. and the small islets, like Vamua Masi, on which trees have become well established, dirt and sand accumulated and coconut palms taken root.

[p.52]

TUVUTHA' I.

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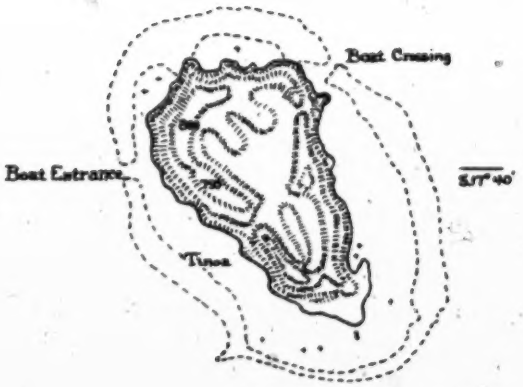
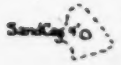
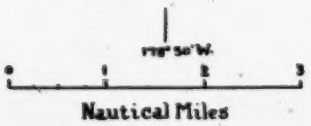


Tavunukui Wai
(Smith Reef of Wilkes)



Tavunukui Vanua
(Smith Reef of Wilkes)



[p.53]

13 21. TUVUTHA' is a high, moderate size island of upraised coral with intrusions of volcanic material, 5 1/2 miles south of Vekai. (S.17° 40', 178° 48' W.) It is triangular in outline, 3 1/4 miles long, 1 3/4 miles wide at the north end, and tapering toward the S.S.E. The rough, heavily forested limestone cliffs, rising to a height of 750 to 800 feet on the west, enclose a central basin. The southern end of this is partly filled by a volcanic ridge, covered with grass, Pandanus, and low scrub. The northern portion of the basin is partly wooded, with groves of cocoanut palms and cleared cultivated areas. There are but [487] two trails leading into the interior. One scales the steep cliff behind Tinoa village and enters by a pass in the high ridge on the S.W. side. The other crosses a low place in the N.E. ridge, behind a sand beach and small volcanic knoll, opposite a boat crossing in the reef.

The island is surrounded by a barrier reef, 400 to 600 yards wide and about 1/2 mile off shore. Anchorage may be had outside the reef at the S.W. end, in the lee of a small horn. There are two boat entrances, one on the west, about 1 1/4 miles N.W. of the village, and the one at the N.E. end. Boats may also cross the reef at high tide near the anchorage at the S.W. corner.

361 The inhabitants, about 100 in number, live in one village, Tinoa, [161] on the S.W. side. Good water may be had from a spring here, but fruit, 312 vegetables and cocoanuts are only obtainable in moderate quantities. 262 The soil in the basin is fertile, but the difficulty of access prevents 134 extensive agriculture. 241

There are two small reefs, Tavunukui Wai and Tavunukui Vanua, to 13 the south of Tuvutha'. The latter contains a sand cay four feet high.

[p. 54]

NAIAU I.

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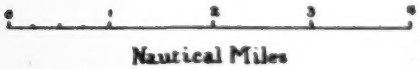

Nautical Miles

[p.55]

13 22. MALAU is a high limestone and volcanic island, 16 miles N.W. of Lakemba and 20 miles S.W. of Tuvutha', (S.17° 58', 179° 04' W.) The island is 3 1/2 miles long by 2 miles wide, and is surrounded by a fringing reef. The high marginal ridge of upraised coral limestone, which rises percipitously on the north to 580 feet elevation, surrounds a dry central volcanic basin, carpeted with grass, scrub and Pandanus. The ridges are well forested.

There is no anchorage for vessels, but boats can cross the reef opposite the village of Salia on the east side, and also on the N.W. side, at high water.

312 Water is not abundant, but may be had at the villages, together with limited supplies of staple groceries and vegetables.

361 There are three villages on the island. Salia on the east side
[366] has a native population of 140 and two chinese stores. Narothivo
[177] is located about a mile and a quarter to the N.N.W. and has 117
[161] people. Liku, with 59 natives is on the south-east side. There is
489 no landing at Liku, and all supplies and copra has to be carried
13 by trail over the ridges and across the central basin. Gaps in the limestone ridges on each side, with gradual slopes of volcanic material leading up to them, make this trail more accessable than
181 that on Tuvutha'. The people appear to be prosperous and produce
245 quite a little copra from the extensive coconut groves.

172 On the high ridge S.W. of Salia there is the site of an
361 ancient fortified village, perched at the top of a cliff.
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[p.56]

VANUA VATU.

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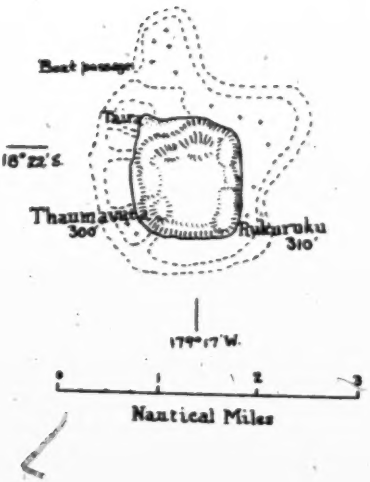

[p.57]

13 25. VANUA VATU is a small island of limestone and volcanic formation, 25 miles S.S.W. of Naisu and 22 miles N.N.W. of Tavunasithi. Like Naisu, it consists of a dry, grassy basin of volcanic material surrounded by a ring of wooded upraised coral limestone hills rising to 300 feet elevation on the S.E. and S.W. The elevation of the central basin is from 200 to 250 feet. The island is slightly over a mile square.

It is surrounded by a barrier reef which joins the shore in several places on the west side. On the N. and N.E. this reef lies from 3/4 to 1 mile off shore, but is close in for the rest of its length. With an off shore wind, small craft can anchor over a 9 fathom shelf close to the reef in the N.W. cove. From here a boat passage leads into a sandy basin, but a second reef, between this and the village can be crossed only at high water.

361 There is a single village, Taira, one of the neatest and cleanest
181 seen in Fiji, at the N.W. corner. Contrary to the statement of lack of
262 food made in the Pilot book (H.O.166,p.275), we found the people quite
312 propperous and both food and water fairly abundant. The central basin
13 is dry and rocky, supporting only grass, scrub and Pandanus, but small
134 pockets of fertle soil among the limestone hills have been cleared and
[241] crops of sweet potatoes and yams are raised.

[p.58]

THITHIA I.

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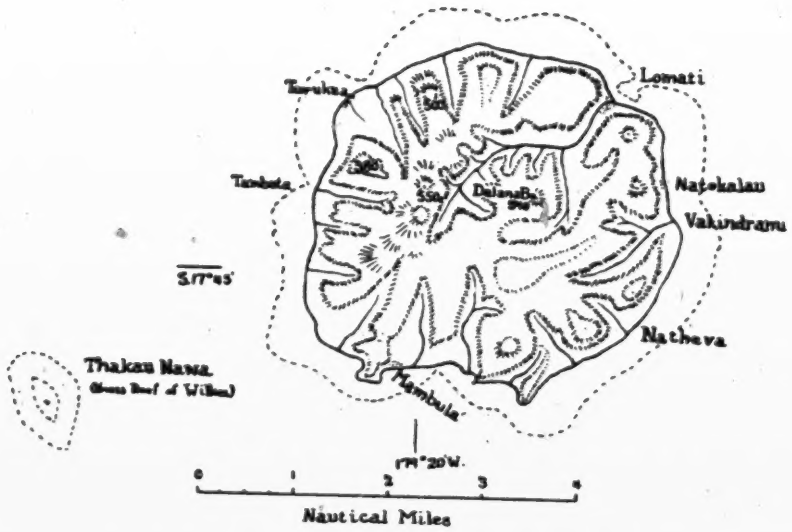

[p. 59]

13 24. THITHIA (pronounced thē-thē-a) is a moderately large, nearly circular island of volcanic and limestone formation, 17 miles N.W. of Nalau and about the same distance S.S.W. of Mango. The island is about 4 miles in diameter, with the interior undulating grassland, rising in several peaks to a height of over 500 feet. Delana Bo, east of the center of the island, is said to be the highest point, but two peaks on the west marginal ridge are as high or higher. As usual, the ridges of upraised coral limestone are marginal, but here they are somewhat reduced in extent, there being also volcanic ridges [312] on the south, west and north sides. A moderately large stream, flowing to the N.E., drains the central portion, and there are numerous smaller streams. Good water is plentiful.

The island is surrounded by a fringing reef, 300 to 800 yards wide. There is a good anchorage off the village of Tarukua, at the N.W. point, with the prevailing S.E. to E. winds. Here landing is good at any time of the tide. There is also a temporary anchorage off Tambuta Plantation, a mile to the south. There is a small break in the reef opposite 60 yards wide the village of Lomati, but as there is very little protection from the prevailing wind, vessels seldom anchor here.

Snakes are ~~abab~~ said to be abundant. There are numerous lizards and land crabs. Besides the usual land birds, introduced mynahs and "magpies" are abundant.

There are several caves in the N.E. cliffs, some containing bats, [135] and one said to have a deposit of low grade phosphate.

361 [161] [622] 161 [366] 179 [743] [759] Thithia is one of the most advanced and prosperous islands of Lau. There are five villages with a combined population of over 400. The residence of the Bula[1] is at Tarukua, at the N.W. end, which has 75 natives and a small Chinese store. The district hospital, with a native practitioner in charge, is located here. Mambula', at the S.W.

[1] [Buli or chief--analyst]

[p.60]

[THITHIA I.]

361 [161] 366 [177] is the largest village, with 123 ~~inhabitants~~ residents and a Chinese store. Natheva is a small village on the S.E., with 40 natives, and also has a little store. Natokalau, on the east side has 65 residents. 361 366 Lomati, on the N.E., at the mouth of the large stream, is a prosperous village with 113 residents and a large Chinese store. Mr. C.B.Crabbe, [205 245] [466] coconut planter and postmaster, who lives here, also keeps a store, mainly for the convenience of his workmen. Two sections of the island, Tambuta 423 on the west side and Vakindranu on the east, are privately owned by the Borron Estate, under the management of Mr. E.J.Brodnam, who is 295 interested in tropical agriculture and natural history. Here extensive groves of coconuts have been set out and much copra is produced.

[p. 61]

MANGO I.

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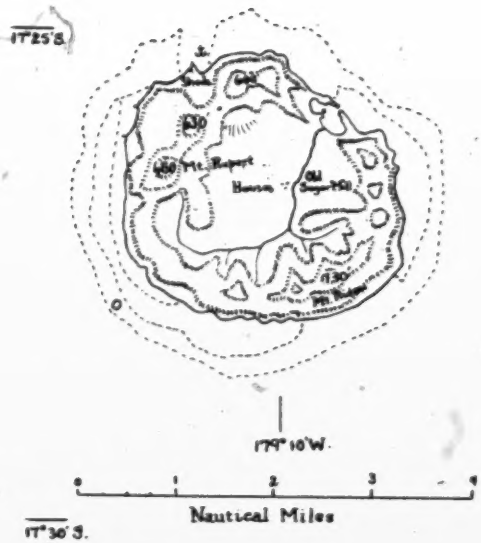

[p. 62]

13 25. MANGO is a moderately large limestone and volcanic island, 8 miles south of Kanathea, 20 miles W.N.W. of Tuvutha', and 17 miles N.N.E. of Thithia. (S.17° 27', 179° 09' W.). It is surrounded by a fringing reef, about 1/2 mile wide. On the north there is a wide gap in the reef, forming an excellent anchorage with the prevailing S. to E. winds. The island is nearly circular, 3 miles in diamtere, and reaches an elevation (Mt.Rider) on the south of 730 feet according to the owner (the Pilot Book, H.O.166, p.372, gives 670 feet). Two other high volcanic hills overlook the west coast, and there is one nearly as high in the north ridge.

This marginal ring of hills, partly volcanic and partly of upraised coral limestone, encloses a broad central basin which is at present 245 thickly planted to coconut palms. It was formally used for the [248] cultivation of sugar cane, and prior to that for raising cotton. The [249] old sugar mill still stands near the owners houses, toward the center 361 of the basin. From it a small tram line runs to the N.E.bay.

497 The island is owned by Mr. James Borron, and is managed by his son. There is no native population other than the workmen employed on the 423 plantation, which are mostly Indians. It is one of the most productive 469 and luxurient islands in Lau, and would be well worth an extended 162 biological survey. There is a dense forest among the limestone hills 13 on the N.E., hanging with tropical vines, and with lianas up to 15 inches in diameter. The volcanic hills are covered with the usual grass and scrub, and here and there are groves of Casuarina trees. A small lake, in the N.W.gap, supports a flock of wild ducks, and other bird life is abundant.

312 Water is abundant. A large stream drains the central basin, flowing N.E. to the nearly enclosed bay. There are also several small lakes and pools of fresh water.

245 At present about 500 tons of copra are produced annually. A herd

[MANGO I.]

233 [136] of about 700 head of cattle are pastured on the grasslands. A herd The hills are roamed by flocks of turkeys.

13 The east bay is of remarkable formation. It is about half a mile long by a quarter of a mile wide, nearly entirely surrounded by a ridge of limestone, and with an entrance scarcely 100 yards wide thru which the flood tide attains a velocity of 7 knots. The tide inside is about half an hour later than outside.

There is a small islet near the outer edge of the reef on the S.W.

[p.64]

9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

KANATHEA I.

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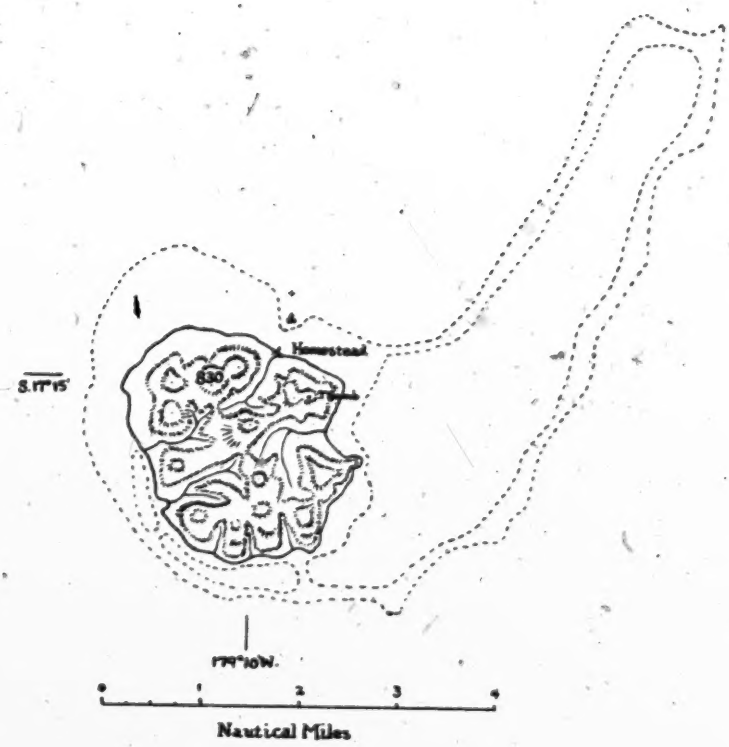

[p.65]

13 26. **KANATHEA** is a circular island of volcanic material, 2 to 2 1/2 miles in diameter, lying 7 miles west of Vanua Mbalavu and 8 miles north of Mango. (S.17° 15', 179° 10' W.) It is surrounded by a fringing reef, and from the east side a loop of barrier reef extends about 6 miles to the N.E., enclosing a spacious lagoon. On the north [509] side there is an indentation in the shore reef within which small craft may anchor within a few hundred feet of a small wharf. The island is undulating and hilly, with several peaks of fair height, the highest (830') overlooking the N.W. shore. On the north-east rises a hill, on the S.E. side of which is a conspicuous thumb-like shaft of volcanic rock. The hills in several places rise in sheer cliffs of this material.

[312] Water is abundant, the interior being drained by several streams.

[245] The valley bottoms and more gradual slopes are thickly planted with coconut palms. The summits of the hills are partly wooded.

423 The island is privately owned and over 600 tons of copra are pro-
245 duced annually. 700 head of cattle are pastured and flocks of ~~233~~
233 turkeys roam the hills. In former times cotton and later sugar cane
136 were successfully grown. There is no native population, all the workmen
248 being Indians.
249
162 As bird life is carefully protected, insects are somewhat reduced
13 in numbers. A strict quarentine is also maintained against weeds.

[p.66]

13 THE EXPLORING ISLES include a somewhat scattered group of islands: Ngillangilla, Vanua Mbalavu, Avea, Sovu, Malata, Susui, Munia, Thibombia-i-Lau, and small islets, all lying within a single barrier reef, 77 miles in circumference. The greatest length (E.& W.) of the enclosed lagoon is 23 miles and its width (N.& S.) is 21 miles. There are five passages thru the reef: two on the west, Andi wathu and Ngillangilla, opposite those two islets; a series, the Sovu Passages, on the north, near the Sovu Islets; the American Passage on the east; and the Tongan Passage on the S.E., between Munia and Thikombia-i-Lau.

The reef is one of the few barrier reefs in Fiji having a sloping outer edge to windward. On this a vessel might anchor. There is deep water within, with comparatively few reefs and coral heads. Depths of up to 100 fathoms have been sounded on the east, but much of the central portion is from 30 to 50 fathoms.

Ngillangilla, Vanua Mbalavu, Malata, and Susui form a long narrow curve, shaped like a figure "2". The N.W. end is of limestone, the central portion volcanic, and the S.E. is mixed volcanic and limestone material. Ngillangilla and the other small islets close in will be included with Vanua Mbalavu.

103 The group received its name from the United States Exploring Expedition, under Wilkes, in 1840.

[p. 67]

13 27. VANUA MBALAVU I. is situated at the western side of the lagoon containing the Exploring Isles. (S.17° 10' to S.17° 20', and 178° 55' to 179° 04' W.) It is 14 miles long and up to 2 1/2 miles wide, with several peaks along its backbone. The N.W.portion, including Ngillangilla I. (510'), which is separated from the main island by a narrow channel, is composed of upraised coral limestone. This continues to be the dominant material south and eastward as far as the two deep bays on the N.E.. On the east side of these the forested limestone cliffs are abruptly replaced by rounded grassy hills. These continue until close to the south end ~~&th~~ which is a narrow limestone ridge. The small islets to the N.W. are limestone. Yanu Yanu, on the S.E. is of volcanic material. The highest peak, Koro Mbasabga (930) and the summits of one or two other peaks of volcanic material are covered with an open growth of forest, similar to that on the high volcanic islands of Matuku, Moala, and Totoya.

361 [423] All of the villages, about 14 in number, are located in the volcanic portion of the island. Nambavatu, in the N.W., is a private estate. Several of the villages were not visited during our short stay, but their populations are tabulated under the Census of Lau.

[648] [349] [368] [177] [563] Lomaloma, with the residence of the District Commissioner, the courthouse, a large native church and ~~&th~~ a few European homes, is situated toward the S.E. end of the island. The northern half of the village (Lomaloma) is Fijian; the southern half (called Sawana) is Tongan, with a separate Buli (chief) and its own city government. The two parts have a combined population of 272. The harbor is well [13] protected, on the east by the islet of Yanu Yanu, and on the N. and S. by outjutting reefs, leaving a small natural basin. In former times [366] Lomaloma was a a large and commercially important place, with several hotels and stores. To it came the old sailing vessels from all parts [439] of the world after copra and native produce from all Lau. But with

[VANUA MBALAVU I.]

361 [505] the establishment of a good stable government in the western part of Fiji, and cutter service between the various islands and Levuka and Suva, most of its prosperity has vanished.

Another large village is Mualevu, at the east foot of Koro Mbasanga. [366] [312] [161] [487] This village has a good store and an abundant water supply, piped down from the adjacent valley, which contains the only real stream seen on the island. The population is given as 196. All the villages are connected by good trails.

241 The island is not as extensively cultivated as it might be. There are small areas of native food stuffs planted in the valleys and on the lower slopes behind the various villages. And the flats are occupied 13 by small groves of coconut palms. But most of the limestone region remains in native forest, and much of the grassy volcanic ridge is left in that state.

[312] [366] Water is not very abundant, but may be obtained at the villages, especially Mualevu. Supplies may be secured there and at Lomaloma.

Anchorage is good in many of the bays, besides at Lomaloma, and landing is possible anywhere in the volcanic region and in many of the limestone bays. The limestone country is extremely rough and uninviting, but pockets may be made to support groves of coconuts, as at Nambavatu.

The "Bay of Islands", south-east of Ngillangilla, contains one long low island and several small islets. Here anchorage is good. Andawathi I. (250') and Yamuthaloa I. (160') lie to the S.S.E. of this bay.

[312] There is a hot spring near the gap between the volcanic and limestone formations at the south end.

[p. 69]

13 28. AVEA is a small island composed of elevated coral limestone and volcanic material, lying a little over a mile off the N.E. side of Vanua Mbalavu. It is 1 3/4 miles long by 1/2 to 5/8 mile wide, pointed at both ends and rising to a height of 600 feet. The center is a small, narrow, wooded plateau, from which rise the two peaks, Salia (600'), and Sangawelangi (about 500'). The slopes rise abruptly from a narrow beach covered with cocoanut palms. The island is fringed with a coral reef on the east side and is connected to the north reef by a coral strip, over which small boats can pass at any time of tide. On the S.E. side is a grassy volcanic hill, the slopes of which are under cultivation.

361 161 312 487 The village, Avea, is located on the S.W. point and has a population of about 60 natives. There is a small freshwater pool at the foot of a cliff on the south end. A good trail leads from here to the village.

172 The remains of an ancient village occupies part of the flat-topped plateau.

13 29. Malata is a small wooded island, of partly limestone and partly volcanic material. It is a continuation S.S.E. of the limestone ridge at the south end of Vanua Mbalavu, with which it is connected by a broad reef which dries at 3/4 ebb tide, with a gap of only a few hundred feet. The island is 1 1/2 miles long by 1/2 mile wide, and rises to a height in the center of 420 feet.

[361] [291] [345] The village is situated on the N.E. side, where there is a grassy and partly cultivated volcanic hill, with a grove of cocoanut palms. Other portions of the island are also of volcanic formation.

30. Susui is a somewhat larger island of limestone and volcanic formation, lying to the eastward of the south-east point of Malata, with which it is connected by a reef which dries at 1/2 tide. It is 2 1/3 miles long by 3/4 mile wide. The western half is of wooded, elevated coral limestone,

[SUSUI I.]

13 the highest portion of which is a central transverse ridge, 430 feet high. The eastern half is a long, grassy flat of volcanic material, thickly covered with groves of coconut palms, which run up the eastern slope of the central hill. On the flat are two small hills covered with Casuarina trees. The village of Susui is situated at the N.W. [361] corner of this flat, at the head of a small bay. It has a population [161] of 67. The island is said to be used as a grazing ground for cattle. [233] Considerable copra is also produced. [295]

To the eastward are two small islands. The larger one, 190 feet high, has a small grove of coconut palms. The smaller, 80 feet high, rises more abruptly with rocky slopes adorned with Casuarina trees.

[p.71]

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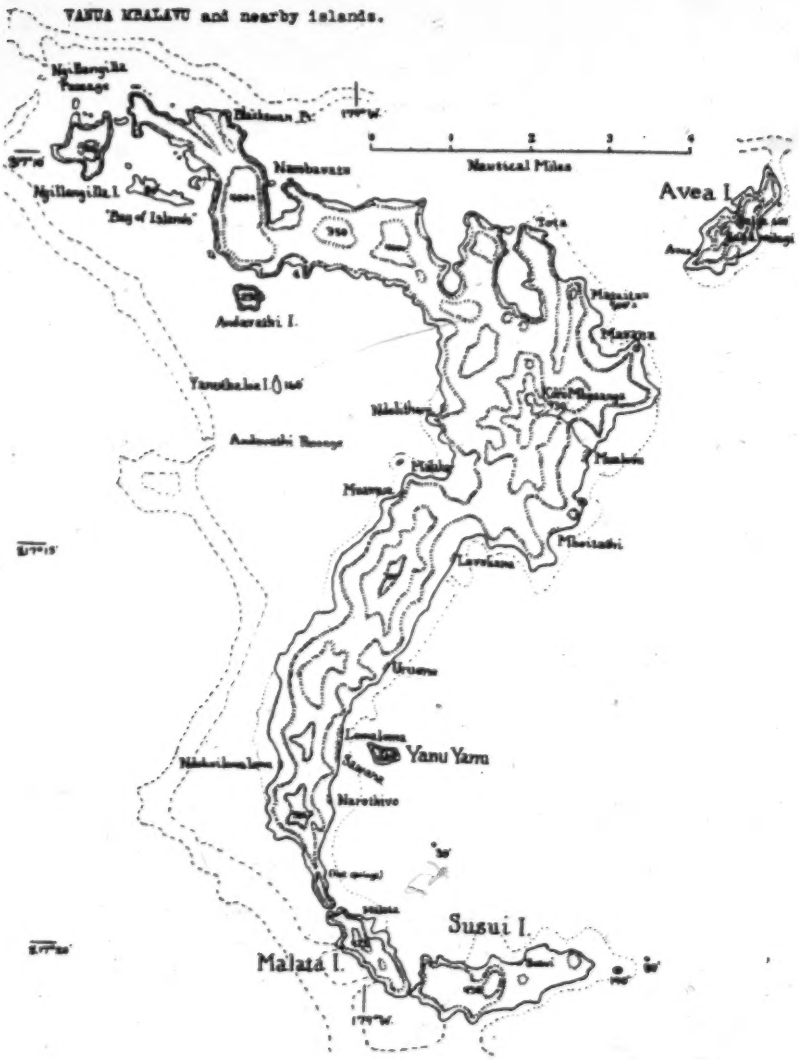
VANUA MBALAVU and nearby islands.



[p.72]

SOVU ISLETS

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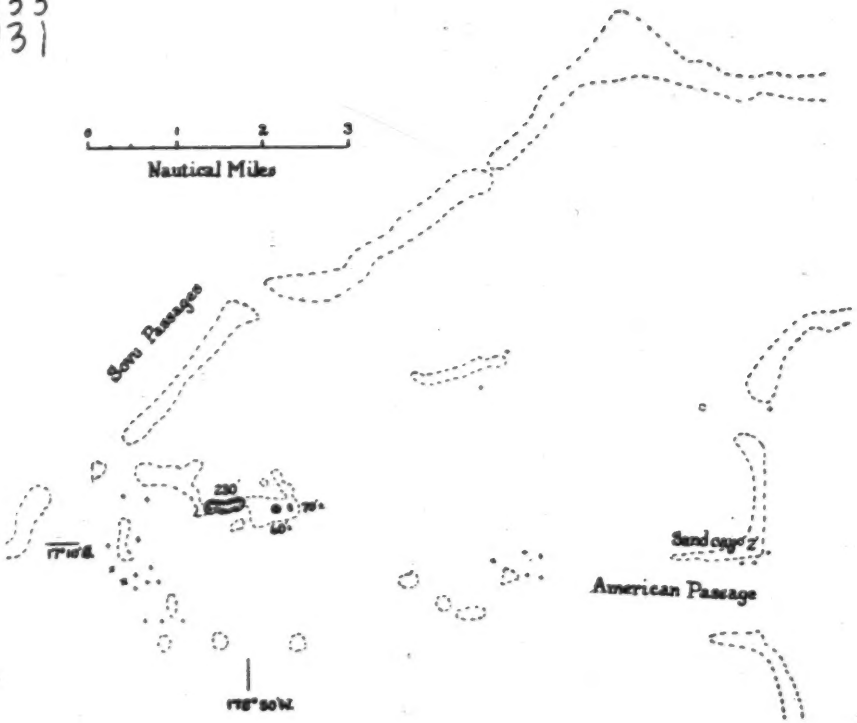

[p. 73]

MUNIA & THIKOMBIA - I - LAU

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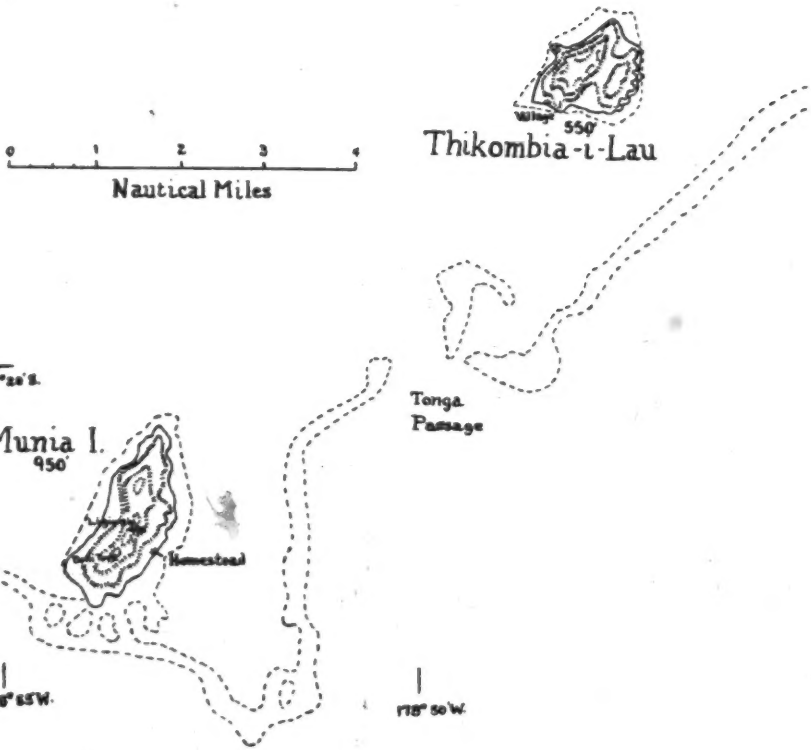

[p. 74]

13 Sl. MUNIA is a small volcanic island, 2 1/4 miles long by 1500 yards wide, lying 3 1/2 miles E.by S. of Susui and 15 miles E.by N. of Mango. A high ridge traverses the island, reaching a height of 950 feet near the center. The island is surrounded by a fringing reef, which connects it with the south side of the barrier reef which surrounds the Exploring group. The island is entirely made up of volcanic material.

423 Munia is privately owned, by Mr. H.H. Steinmetz, an Englishman, who
162 produces copra. His homestead is located on the S.E.side at a place
245 where there is a small bight in the reef. Here a pier has been built
361 out nearly to deep water. Anchorage here is fair, except when the
509 strong
13 wind is from the S.E.to N.E. A better anchorage may be found in the lee of the island. Good paths traverse the island and its slopes are
487 thickly planted with cocoanut palms. Water is fairly abundant, there
312 being several wells.

Mr. Steinmetz has kept careful meteorological records for the
127 past 29 years (1924). A summary of his rainfall data is given in the introduction.

464 There is no native population on the island other than the workmen.
161 er It formally possessed native inhabitants, however, and bones and ethno-
[172] logical objects have been dug up about the homestead.

[p.75]

13 32. THIKOMBIA - I - LAU is a small limestone and volcanic island located on the east side of the lagoon, 5 1/2 miles N.E. of Munia. It is irregularly rectangular in outline, 1 1/4 by 1 1/8 miles, and rises to a height of 550 feet. The western part consists of a volcanic plateau surrounded by a ring of coral limestone hills, thus forming a raised basin, similar to Vanua Vatu. The eastern part is a steep hill with spurs of volcanic conglomerate, separated from the western mass by a low divide connecting the heads of two deep valleys. The south and east sides are furrowed by small valleys or pockets running back from the sea. Here the beach is alternately volcanic rock, sand and sandstone.

361 [761] 241 The village of Thikombia, on the S.W. end, consists of a dozen houses, with a population of 50. There are extensive cultivated areas in the volcanic basin, and small groves of coconut palms along the beach and in the N.E. and S.E. valleys. Water is not abundant, rainwater being waught and stored in a cement tank at the village.

312

Vessels may anchor in the lee of the island, and landing is good both at the village and on the north sand beaches. Trails lead up onto the plateau from both the north and south sides. A burial cave containing numerous skeletons was explored on this plateau.

13 487 764 172

[p. 74]

13 33. The SOVU ISLANDS, three small uninhabited limestone islets, are situated on the north side of the lagoon, 4 miles E. by N. from Avea, and 6 miles N.by W. of Thikombia-i-Lau.

The larger ~~äää~~ islet, on the west, is about 3/8 mile long by 100 to 200 yards wide, with a height of 230 feet. It is composed of very rough upraised coral limestone, rising abruptly from an undercut ledge on all sides, and is similar to the Yangasa islets. It is densely covered with lowland forest, herbs and vines.

The middle islet is subcircular, with gentle slopes, about 200 yards in diameter and about 60 feet high. There is a small sand beach on the N.W. and another on the S.E. The slopes are wooded and there are a few coconut palms. It is composed of elevated coral limestone, but is less rough than the larger islet.

The small, eastern islet is elliptical in outline, about 125 yards long, 40 to 50 yards wide, and 60 to 75 feet high. Its rough coral sides rise abruptly from the water, and its top is covered with vines, scrub, and a grove of native fan palms. There are also a few of these palms on the largest islet.

The usual lizards, water snakes and land crabs, including the large red-brown coconut crab were present. No fresh water was seen on any of the ~~äää~~lets. [312]

Anchorage is good on the lee side of the islets. Landing is possible on all three, but easy only on the middle islet.

[p.77]

KIMBOMBO ISLETS and detail of middle islet.

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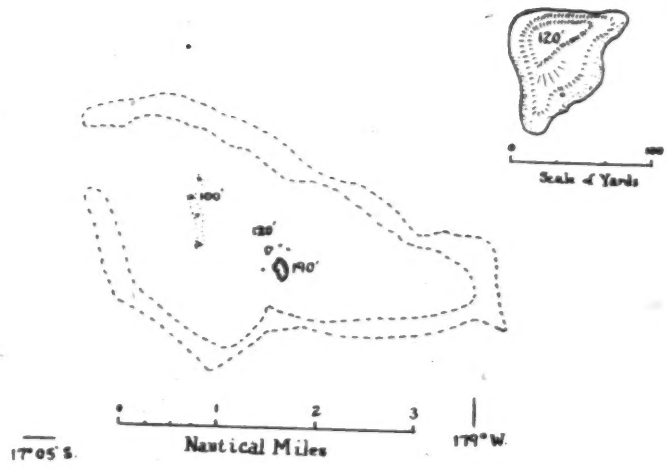

[p. 78]

13
[161] **34. The KIMBOMBO IS.** are a group of 3 small, uninhabited islets, 6 miles north of the N.W. end of Vanua Mbalavu and 13 miles eastward of Naitaumba. They are surrounded by a barrier reef, 4 1/2 miles E.& W. by 3 miles N.& S. An entrance on the N.W. admits vessels into the lagoon, where good anchorage may be found.

The largest islet, the south-eastern one, is sub-crescent-shaped, about 300 by 400 yards. It is composed of exceedingly rough coral limestone and surrounded by an undercut shelf. The islet slopes up gradually from the N.& W. to a height of 190 feet, to fall sheer to the water on the east. The slopes are densely covered with the usual trees, shrubs
[3/2] and herbs found on rough limestone islands. There is no fresh water and insect life is scarce. A number of "flying foxes" (fruit bats) and the usual land crabs were seen. There are two small rocks off the N.W. side.

The middle islet, although only 200 or 300 yards to the N.W., is composed of conglomerate and bedded tuff of volcanic origin. The bedded strata dip to the E. and N.E. at an angle of about 30°. The islet is 100 by 60 yards and 120 feet high. It slopes up gradually from the S.E. with a cliff on the N. and N.W. A sand beach borders the W. and S.E.
[36] sides, with a hut and small grove of coconut palms. The rounded summit is covered with small trees, and the slopes with casuarinas.

The small islet, on the W., is a steep pinnicle of tuff and conglomerate, about 100 feet high. completely surrounded by a sand beach, with coconut palms on the south and a few small trees on the summit. A line of reef runs out to a patch of flat rocks on the N.E., and a similar reef connects the islet with two flat rocks to the south.

114 The observations of Agassiz (Bull.Museum Comparative Zoology, XXXIII, p.88, 1899), that the highest island is volcanic and the other two of elevated limestone, is incorrect.

[p.74]

WAILANGILALA I.

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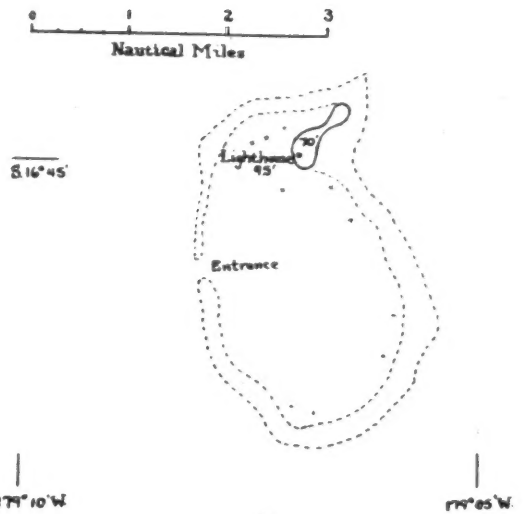

[p. 80]

13 35. WAILANGILALA is a flat sand island underlain by coral limestone, a mile long and 600 yards wide at its widest ~~part~~ part. It is the most northern of the Lau Group, lying 18 miles N.N.W. from Kimbombo Islets. (S.16° 45', 179° 06' W.). The island is surrounded by a barrier reef, 2 1/2 miles wide (E.& W.) by 3 3/4 miles N.& S. Thru this there is an entrance on the west 240 yards wide which admits vessels into the lagoon, where good anchorage may be found.

The island is thickly covered with littoral plants and cocoanut palms, reaching a total height of 70 feet above sea level. Toward the north there is a bare narrow isthmus, with a wooded section beyond, giving the appearance of two islands.

349 On the S.W. side is a 95 foot circular, white iron tower, with a
361 flashing white light, visible 15 miles. The lighthouse keeper and his
241 assistant have neat substantial homes near by. They cultivate small garden plots and dry copra from the extensive cocoanut grove. Some
[312] vegetables and papayas may be obtained. Rain Water is stored in a tank.

114 An account of a boring made on this island in 1897 is given by Alexander Agassiz in the Bulletin of the Museum of Comparative Zoology, Cambridge, Vol.XXXIII, pp.45 to 48, 1899. The island must have changed considerably in shape since that time, as it does not at present agree with maps given on pages 45 and 46. Even the position of the lighthouse is different.

[p.81]

NAITAUKBA I.

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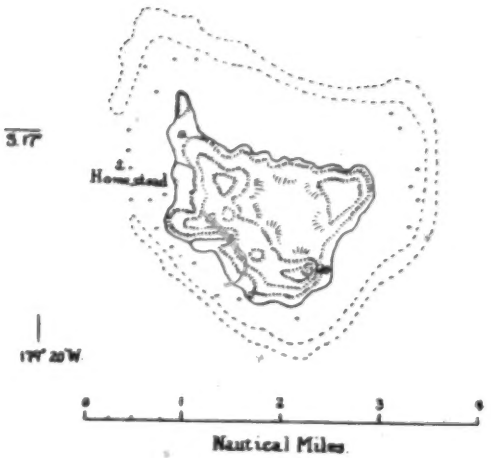

[p.82]

13 86. NAITAUMBA is a trapezium-shape volcanic and limestone island, lying 15 miles N.W. of Vanua Mbalavu and 18 miles S.W.of Wailangilala. It is surrounded by a barrier reef which lies from 1/4 to 3/4 mile off shore. On the west the reef is reduced to a line of coral heads and patches. Here small boats may enter. Vessels may anchor, with an off shore wind, on a narrow shelf off this west side.

The island is 2 miles E.& N. by 1 1/2 miles S.& S. A central basin is surrounded by limestone and volcanic hills, the highest, on the S.E., reaching an elevation of 610 feet in a flat-topped volcanic peak rising with steep slopes. The limestone portions, especially on the N.E. and N.W. are densely wooded; the volcanic hills are covered with the usual grass, scrub and pandanus; and the basin contains an extensive grove of coconut palms.

423 The island is privately owned by Mr.G.M.Henning, who resides at a
361 homestead on the west side. Considerable copra is produced. Fresh
245 water is abundant, and small quantities of produce, turkeys, etc.,
312 might be obtainable at the homestead. Good trails traverse the island.
487 There is no native population other than the plantation workmen.
161
469

The MALIMA Islets, two small uninhabited islets lying 6 miles S.E.
13 of Naitaumba, were not visited. They are surrounded by a continuous circular barrier reef, about 2 miles in diameter, with a small boat passage on the north side. The larger islet reaches a height of 130 feet in a conspicuous lump on its S.W. end. The lagoon contains numerous rocks and coral heads.

[p.83]

NUKUTOLU ISLETS, YATHATA AND KAIMBU.

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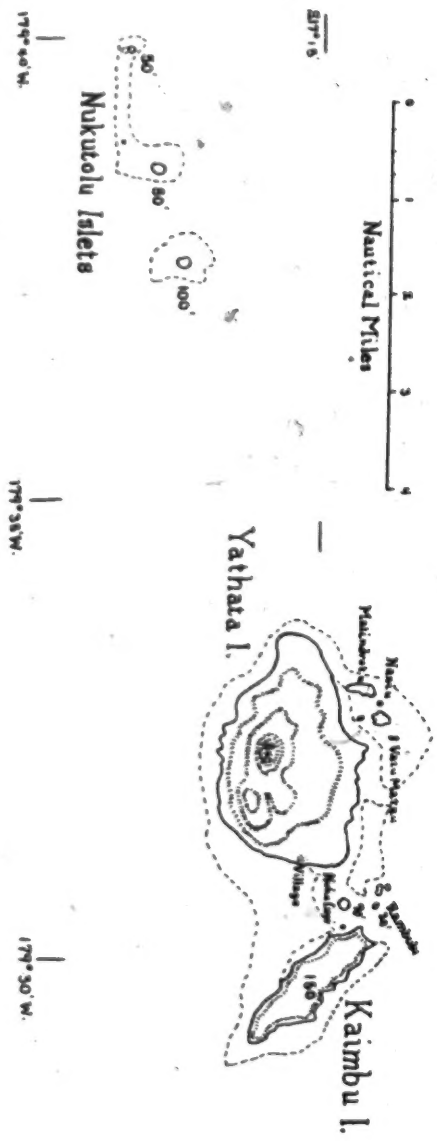

[p. 84]

13 [103] 37. YATHATA (or Cap island, so called because its profile resembles a cap with button) is a limestone and volcanic island, lying 18 miles S.W. of Naitaumba and 19 miles west of Kanathea. (S.17° 16', 179° 32' W.) It is surrounded by a fringing reef which also encloses the low limestone island of Kaimbu and several smaller islets and rocks. There is a boat passage on the N. side with good landing on a sand beach toward the N.E. end. There is no anchorage.

The island is about 1 1/2 miles E.& W. by 1 1/2 miles wide. Toward the center there is a steep, flat-topped, wooded limestone peak, 840 feet high and on the S.E. a rounded, grassy volcanic hill. The coast on the [241] east and N.W. is sandy with groves of coconut palms, and there are cultivated area on the S.W. side of the central peak.

361 368 312 481 172 112 13 The village, with 25-30 native houses and a frame church, is located on the east side. S.W. of the village is a small fresh water pool. The island is traversed by trails. The ruins of an ancient fortified village occupies the summit of the central peak, Na Koro Levu (840'). The volcanic hill, called Dilla Thata, is about 500 feet high.

13 38. KAIMBU was not visited. It is about 1 1/2 miles long (NW-S.E.), by 1/2 mile wide. It is composed of elevated coral limestone, with a flat surface ~~averaging~~ 150 feet high. Portions are wooded, and others partly [241] cultivated. The small village is on the N.W. side.

[361] The small sand islet of Nukuluve, between Yathata and Kaimbu is densely covered with coconut palms. The 90 feet elevation is to the top of the vegetation. The other small islets, 20 to 30 feet high, are mostly coral limestone and of no great consequence.

13 39. NUKUTOLU ISLETS are three in number, composed of sand and coral reef, and situated about 4 miles westward of Yathata.

The eastern islet is the largest, eliptical in outline, about 350 yards N.& S. by 250 to 300 yards wide, and covered with littoral trees and cocoanut palms, 100 feet to the top of the vegetation. It is surrounded by a fringing reef, reaching about 1/4 mile off shore.

The middle islet is somewhat smaller and lower, being about 80 feet to the top of the vegetation, with a few cocoanut palms on the S.W. side. The trees are here reduced to stunted scrub. The fringing reef lies about 1/4 mile offshore on the N.W., and closer on the east. On the south it makes a sharp elbow and extends westward to the western islet in a narrow arm. There is a small rock at the elbow.

The western islet is ~~abbbbbat~~ the smallest, not over 40 or 50 feet high to the top of the bushes. It has a small flat, with an open covering of scrub and vines. To the south, a rocky shelf extends above water for about 100 yards.

We found fair anchorage on a shelf in the cove, west of the middle islet. The islets are uninhabited, but are occasionally visited by the natives of Yathata for cocoanuts and turtle.

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[p.86]

VATU VARA I.

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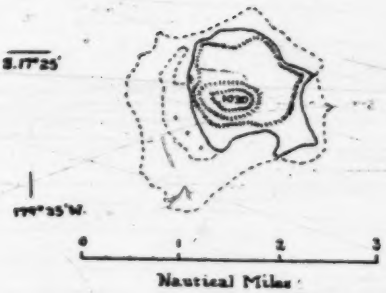

[p. 87]

13 40. VATU VARA' I. (or Hat island, because of its resemblence, in
[103] profile from the E. and W., to a slouch hat) lies 9 miles south of Yathata. (S.17° 26', 179° 32' W.) It is surrounded by a fringing reef with a shall shallow lagoon on the west. This island is the highest in Lau, the bold central peak rising to a height of 1630 feet. The slopes
[172] of this peak rise percipitously to a flat, crater-like summit, where the
[712] ruins of a fortified village are located.

The island is sub-circular, about 1 1/4 miles in diameter, with a square point on the S.E. It is composed of upraised coral limestone, densely wooded, and with small groves of coconut palms in pockets around
423 the foot of the talis slopes, and on the beaches. It is privately owned
361 by the estate of the late Captain Wilson. The neat, substantial home-
245 stead is located on the west side. Copra is produced.

13 Landing may be made without difficulty on ~~the~~ a sand beach on the N.
502 side, thru a small break in the reef, marked by a beacon.

464 There are no inhabitants except the caretaker and a few workmen.
161 Water is not abundant, and but little cultivation is done.
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241

[p.88]

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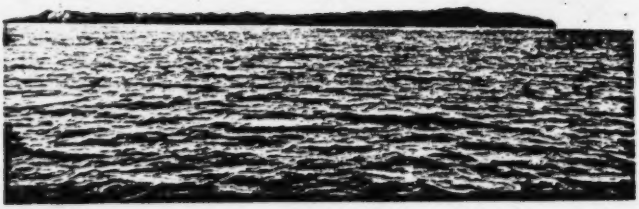
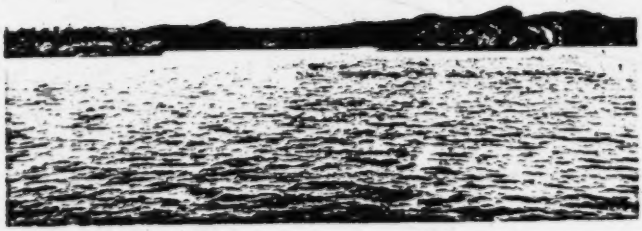


1. Most of the Coral Limestone islands are low and flat, without conspicuous elevations. Ongea Ndriti I., looking E.S.E. from a point about 200 yards inside Barracouta Passage.



2. A closer view of the N.W.side of Ongea Ndriti. Note the undercutting at the water level. The island at the left is covered with native fan palms, shown in fig.3.

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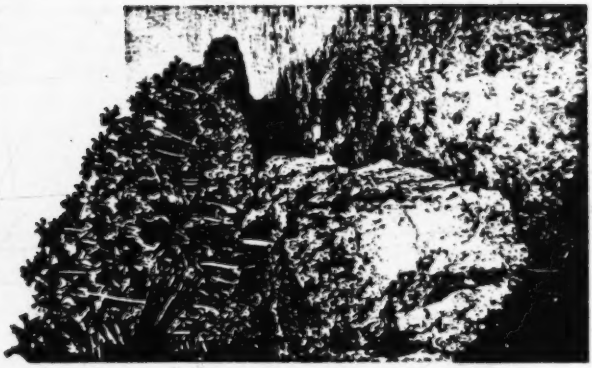

3. A typical small coral limestone island, off the N.W. side of Ongea Ndriti. It rises percipitously from the undercut ledge to a rough flat top covered with native fan palms.

4. The east face of Ongea Levu rises in a sheer wall, 100 to 200 feet high, covered with ~~dddd~~ stunted scrub and occasional wind swept fan palms.

[p.90]

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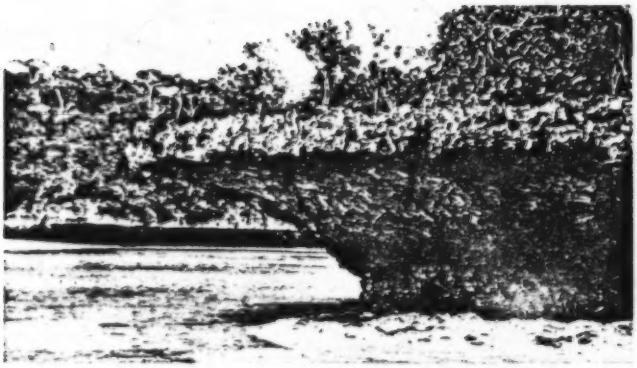

5. The undercut beach at low tide. This view is in the channel between Ongea Levu and Yamuia Islands. The lip of the ledge is about 9 feet above the sand flat or low tide level.

6. Naiambo islet from the W.N.W.

[p. 91]

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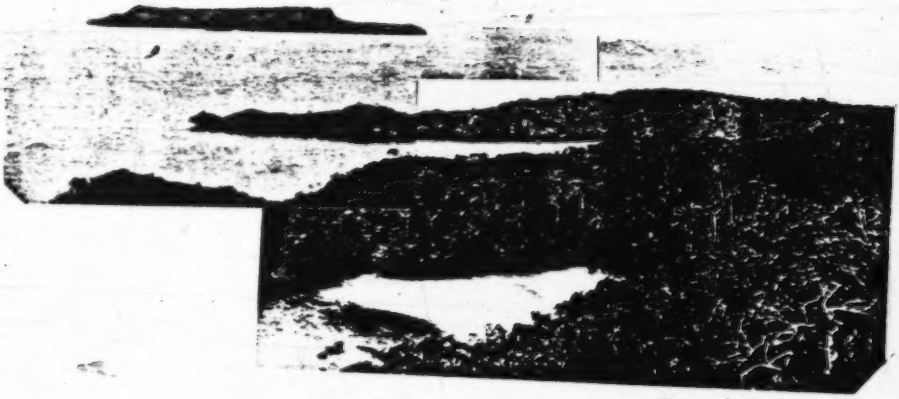
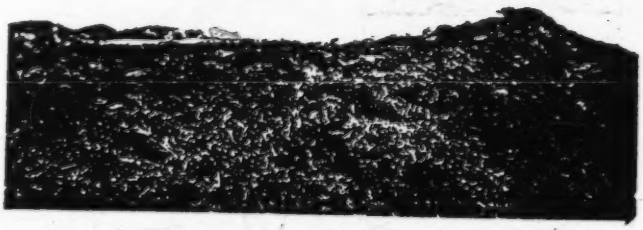


7-8. Yangasa Levu I. and the N.E.bay of Navutu-i-Loma, Yangasa Cluster.



9. The heavily wooded N.E. ridge of Navutu-i-Loma I. with Nuvutha and Navutu-i-Ra in the distance. The N.W. bay is at the left.

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10. Mothe and the northern islets of Karoni I. from the summit of Karoni peak (120 feet), shown in 11. Note the little native cutter making for the passage.

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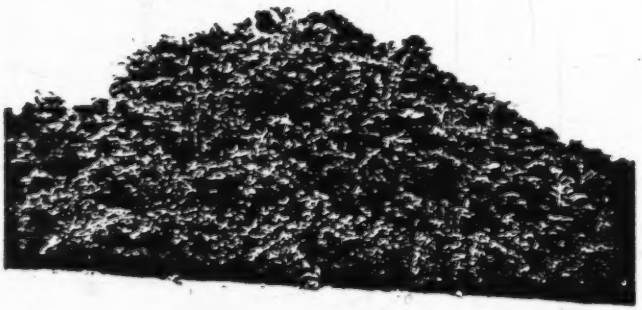

11. The steep, wooded main limestone peak of Karoni I., 120 feet high.

[p.93]

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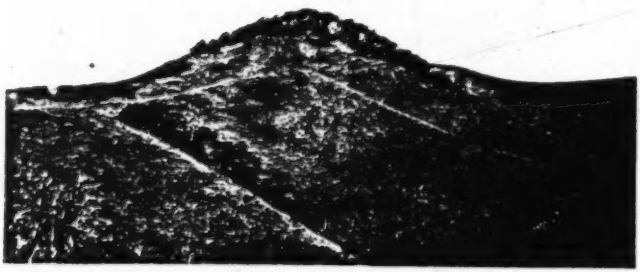
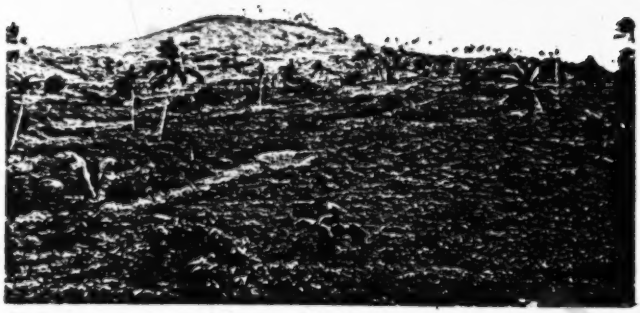
12. A typical valley on Mothe. In contrast to the heavily wooded limestone, the slopes of the volcanic islands are covered with grass, ferns, scrub, Pandanus and Casuarina trees, with groves of coconut palms toward the sea.



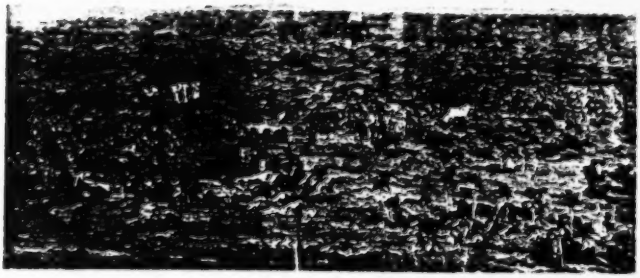
13. The central knob of Mothe is capped with low-land forest, which has worked its way up the valley bottoms.

[p.94]

137
133
[241]



14. Delai oloi (470 feet), a volcanic peak on an otherwise limestone island. In the foreground are gardens cultivated by the natives. Kambara I.



15. From the summit of Delai oloi one obtains a fine view of the wooded central limestone basin of Kambara, stretching away to the S.S.E.

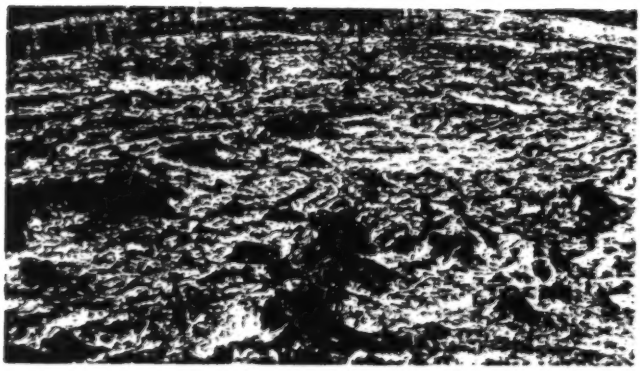
[p.95]

133

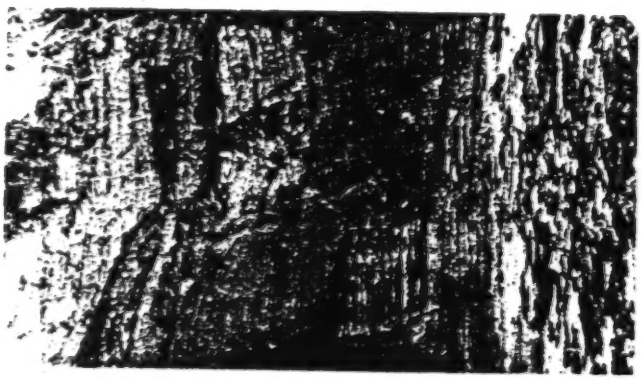
16. Tokalau village and the north limestone wall of Kambara from the summit of Delai oloi; Wangava I. in the distance. Between the volcanic slope and the coral limestone formation there is a marked depression, seen in the foreground.

17. Olorua I. from the N.W. with Komo I. beyond (on the left).

133



18. Outcrop of bedded strata on the low divide between the two main hills, Olorua I.



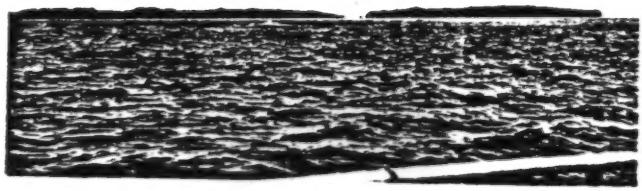
(Bottom)

19. Bedded Tuff at the S.W.point of Olorua I. These strata dip to the S.by E. between 5 and 10 degrees.

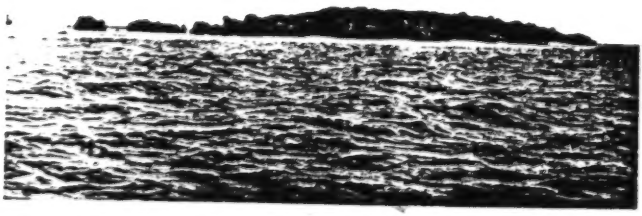
[p.97]

9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

133



20. The Aiwa Islands, looking S. W. from outside the line of reef and coral heads.



21. Vanua Masi I. from the N.by E.

[p.93]

133

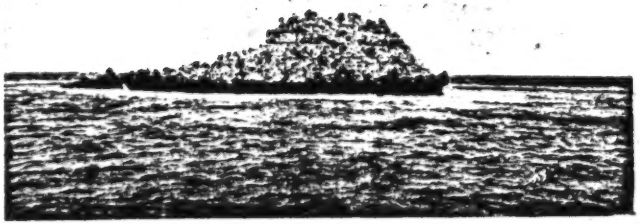
1

22. The west face of Bacon Islet.

23. Latei Viti from the E. by S.

[8.94]

133



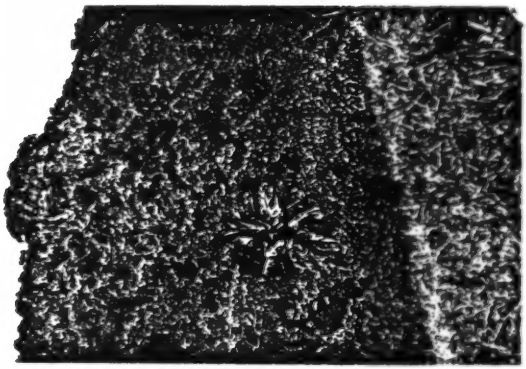
24. Latei Tonga, looking E.S.E.

133
139

25. The northern third of Katafanga I. is of coral limestone formation, the southern two-thirds is volcanic. This is the abrupt transition between the two very distinct types; steep, heavily wooded limestone on the right; gentle, grassy volcanic slope covered with coconut palms on the left.

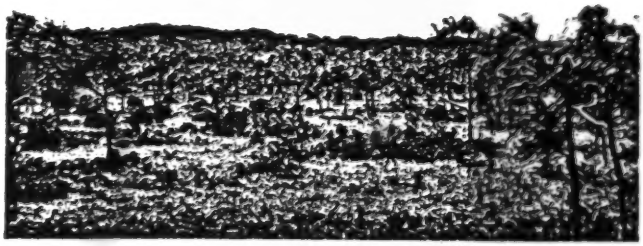
[p. 100]

133
139



(Bottom)

26. A highly elevated cliff of coral limestone, rising behind a grassy volcanic hill, on the N.E. side of Tuvutha'.



27. The volcanic basin, surrounded by coral limestone hills on the island of Vanua Vatu. This vegetation is typical of volcanic soil.

[p. 101]

361
342

28. The village on Vanua Vatu is one of the neatest in Lau.

133

29. Volcanic and coral limestone hills near Tarukua village, Thithia.

[p. 102]

9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

30. Curiously eroded lava rock, Mambula' Bay, Thithia.

31,32. Panorama of Lomaloma and islands to the S.E. Left to right:-
Munia, Yanu Yanu, Susui, Malata.

[p.103]

133

9: Bryan N-5 (1924) 1924

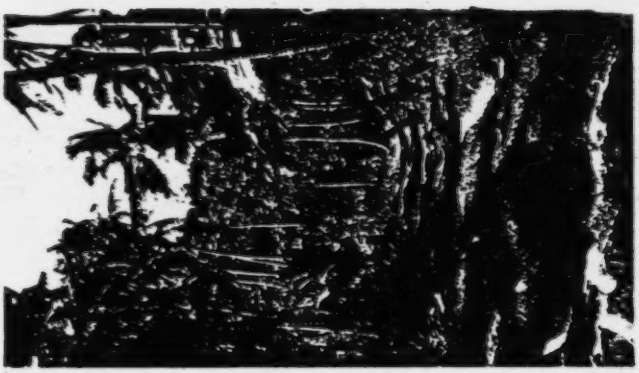
OQ6 Lau OQ6

33-34. Panorama of Mango, from summit of Mt. Rider, 730 feet.

35-36. N.E.portion of Kanathea I. from the S.W. peak.

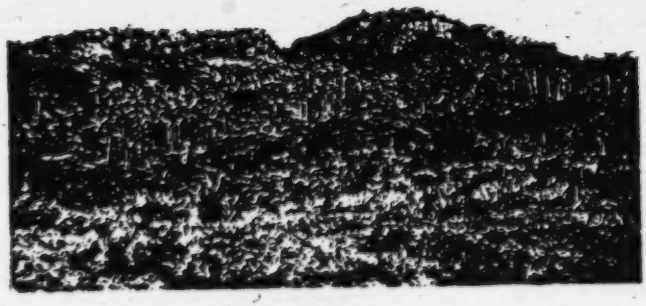
[p. 104]

137
487



37. All the villages on Vanua Mbalavu are connected by good paths. This is a typical section of one, north of Lomaloma.

133



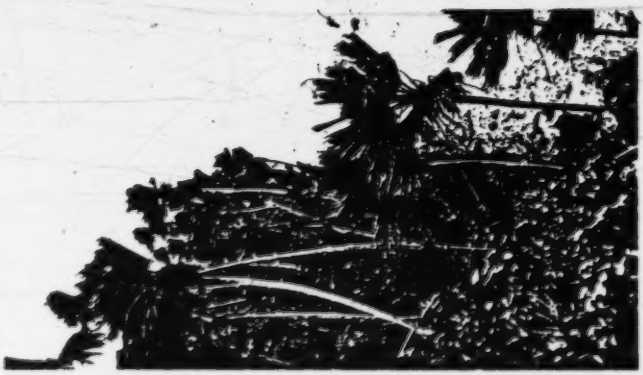
38. Central basin of Thikombia-i-Lau, of mixed volcanic and limestone formation. Looking east from near the center.

[p. 105]

133

39. The Sovu Islets, looking N.W.

137



40. Native fan palms on the smallest, eastern Sovu islet.

[p. 106]

133

41. Middle Sovu Islet, looking west from the eastern islet. Large island of Vanua Mbalavu in the left distance.

42. The Kimbombo islets from the W. by S.

[p. 107]

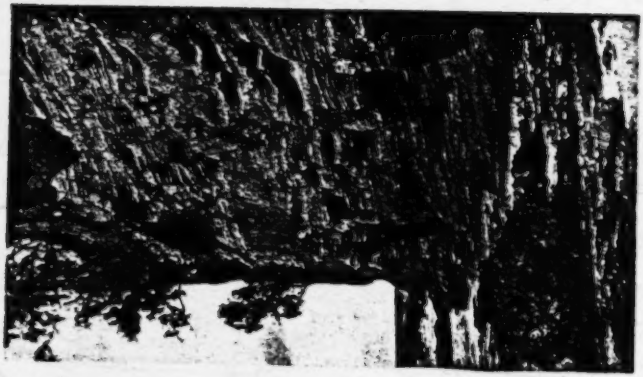
133

43. The eastern Kimbombo islet is of coral limestone formation.

44. The middle Kimbombo islet is composed of bedded tuff of volcanic origin. The picture shows how close it is to the limestone eastern islet.

[p. 108]

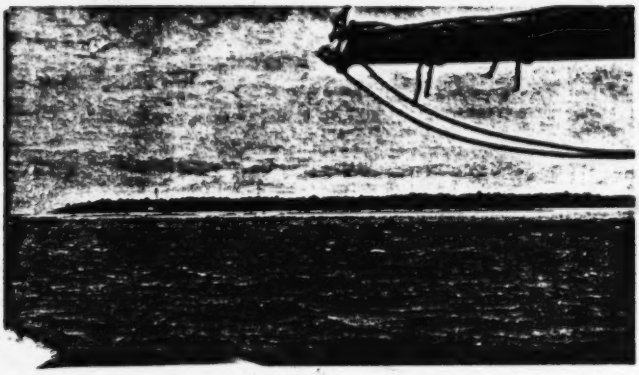
133



(Bottom)

45. Bedded tuff formation in the north cliff of middle Kimbombo islet.

[349]



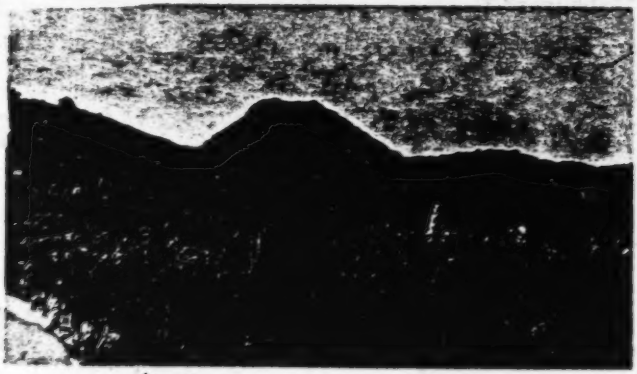
46. Wailangilala I. from the S.W. The island is low and sandy, rising to a height of 70 feet to the tops of the coconut palms. The lighthouse is at the left.

[p. 109]

9: Bryan N-5 (1924) 1924 OQ6 Lau OQ6

133
137

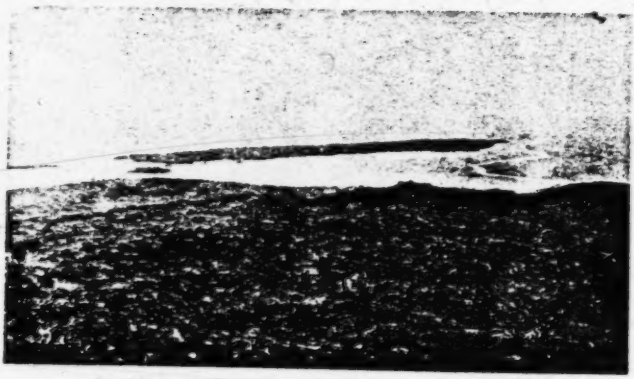
47. The 610 foot, flat-topped peak on Naitsumba, looking S.SW. along the eastern rim of the central basin.



48. Na Koro Levu, elevated limestone peak (540 feet), and the north slope of the grassy volcanic ridge, Mila Mata, Kabara I.

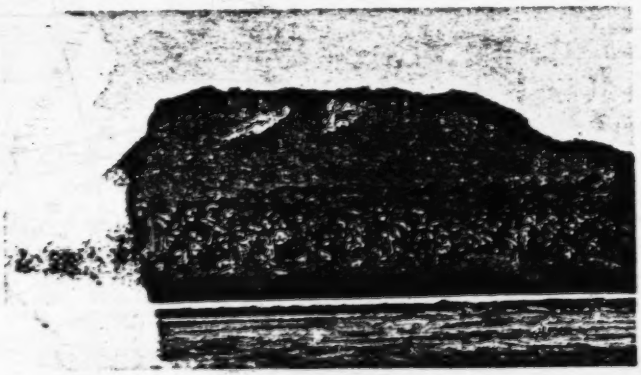
[p. 110]

133



49. East slopes of Yathata and the island of Kaimbu, from the summit of Na Koro Levu, (840 feet).

133
137



50. The highest elevation in Lau, Dillana, 1030 feet high, of upraised coral limestone, Vatu Vara I.

9: Bryan

Lau OQ6

131, 133, 136, 137

/Information in text on the location, topography, geology, fauna and flora of each of the forty islands in the Lau group will be found in category 13./